SAMSUNG

COLOR TELEVISION RECEIVER

Chassis : S15A
Model: CK33H1VR5X/BWT
CK50H1VR5X/BWT

SERVICE Manual

COLOR TELEVISION RECEIVER

CONTENTS

1. Precautions
2. Specifications and IC Data
3. Disassembly and Reassembly
4. Alignment and Adjustment
5. Troubleshooting
6. Exploded View and Parts List
7. Electric Parts List
8. Block Diagram
9. PCB Layout Diagram
10. Wiring Diagram
11. Schematic Diagrams

ELECTRONICS

© Samsung Electronics Co., Ltd. **MAY.1998**
Printed in Korea
3S15A-5001

7. Electric Parts List

7-1 CK33H1VR5X/BWT (CK50H1VR5X AND CK33H1VR5X Dissimilar Parts)

Loc. No.	Code No.	Description ; Specification	Remark
		ASSY-PCB,MAIN(OPT)	
		BUYER : SMSC (RUSSIA)	
*	AA94-10136G	ASSY-PCB,MAIN(OPT);CK33H1VR5X/BWT,S15A,RUSSIA,-	
C409	2306-000327	C-FILM,MPPF;6.3nF,3%,1.6KV,TP,28.5x18x10,2	
C410	2201-000984	C-CERAMIC,DISC;680pF,10%,2KV,Y5P,TP,11x6,7.5m	
C416	2306-000195	C-FILM,MPPF;360nF,5%,400V,TP,26x19x11.5,20	
C611	2301-000264	C-FILM,PEF;4.7nF,5%,50V,TP,6.5X5.5X3.0X5,	
C612	2401-001323	C-AL;470nF,20%,50V,BP,TP,5x11,5mm	
C811	2401-002215	C-AL;2200uF,20%,25V,WT,TP,13x25,5mm	
CN501	AA39-20109A	LEAD-CONNECTOR,ASSY;-,YBNH025-08,S,8P,400,1007#26	
CN602	3711-002643	CONNECTOR-HEADER;BOX,4P,1R,2.5mm,STRAIGHT,-	
CN802	AA27-20003U	COIL-DEGAUSSING;-,14,16.4ohm,75T,890mm,D	
D208	2001-000009	R-CARBON;20Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
EY303	AA60-40011A	EYELET;ID2.0,OD2.8,-,-,BST,-	
EY304	AA60-40011A	EYELET;ID2.0,OD2.8,-,-,BST,-	
⚠ IC602	1201-000537	IC-AUDIO AMP;7057,ZIP,13P,-,DUAL,40dB,PLAST	
L102	2701-000211	INDUCTOR-AXIAL;68uH,10%,2.5x3.4mm	
L304	2701-001028	INDUCTOR-AXIAL;22uH,10%,14x4.5mm	
L401	AA27-30001A	COIL-LINEARITY;-,157uH,QIC1010,PI0.4,4.5x28,S	
L809	AA27-10002Y	COIL-CHOKE;-,100uH,K,10,700mA,T,100UH-K(S	
L810	AA27-10002Y	COIL-CHOKE;-,100uH,K,10,700mA,T,100UH-K(S	
LD901	0601-001032	LED;ROUND,GRN,5mm,565nm	
PK1651	AA68-50067A	LABEL-RATING;T/P 90(G),T0.2,-,-,-,-,ALL	
Q201	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q202	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q204	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q701	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q901	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q902	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
Q903	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
QA01	0501-000389	TR-SMALL SIGNAL;KSC815,NPN,400mW,TO-92,TP,120-	
R302	2003-000649	R-METAL OXIDE(S);330ohm,5%,1W,AF,TP,3.3x9mm	
R305	2004-004087	R-METAL(S);1.5ohm,1%,1/2W,AA,TP,2.5x6.5mm	
R420	2004-001377	R-METAL(S);120Kohm,1%,1/2W,AA,TP,2.4x6.4m	
R501M	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm	
R502M	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm	
R505	2008-001015	R-FUSIBLE(S);1.5ohm,5%,2W,AF,TP,3.9x10mm	
R605	2001-000347	R-CARBON;13Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R606	2001-000007	R-CARBON;3Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R610	2001-000347	R-CARBON;13Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R611	2001-000007	R-CARBON;3Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R717	2001-000009	R-CARBON;20Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R814	2008-000256	R-FUSIBLE(S);1.5ohm,5%,2W,AA,TP,3.9x10mm	
R815	2008-000190	R-FUSIBLE(S);1.2ohm,5%,2W,AA,TP,3.9x10mm	
R908	2001-000214	R-CARBON;1.1Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R909	2001-000449	R-CARBON;2.2Kohm,5%,1/8W,AA,TP,1.8x3.2m	
RA01	2001-000832	R-CARBON;510ohm,5%,1/8W,AA,TP,1.8x3.2mm	
RA02	2001-000577	R-CARBON;2Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
⚠ T444	AA26-30005H	TRANS-FLYBACK;-,FSV-14A001D(S),14,125V	
⚠ V999	3704-001089	SOCKET-CRT;7P,22.5PI,12PI,SN,-	
		ASSY-CRT	
⚠	AA03-10001D	CRT-COLOR;-,A34KQV42X,+380MG,14,90DEG,5	
⚠	AA27-50001K	DEFLECTION-YOKE;-,DSE-1422FL,14/A34KQV42X,PCL	
	AA27-60001L	MAGNET-CONVERGENCE;-,NY-225,22.5mm	

Loc. No.	Code No.	Description ; Specification	Remark
		ASSY-CABINET,OPTION (CK33H1VR5X)	
*	AA91-10371D	ASSY-CABINET,FRONT;-,CK33H1VR,BK708P HITRON,HB,BL	
	AA64-31232D	CABINET-FRONT;-,CK33H1VR,BK-708P HITRON,HIPS	
	AA61-40010A	BOSS-WING;-,HIPS,HB,NTR,-,-	
	AA64-31233B	CABINET-BACK;-,331H,-,HIPS,V2,BLK,-,-	
	AA65-30106A	CLAMP-D,COIL;NYLON 66,V2,NTR,-,14 INCH,-	
	AA64-70009F	BADGE-BRAND;AL,SS R800 22,SILVER,L40,-,-,-	

7-2 CK50H1VR5X/BWT Parts List

Loc. No.	Code No.	Description ; Specification	Remark
		ASSY-PCB,MAIN(OPT)	
		BUYER : SMSC (RUSSIA)	
*	AA94-10136N	ASSY-PCB,MAIN(OPT);CK50H1VR5X/BWT,S15A,RUSSIA,-	
C101	2401-000939	C-AL;22uF,20%,25V,GP,TP,5x11mm,5	
C102	2401-001082	C-AL;330nF,20%,50V,GP,TP,5x11mm,5mm	
C103	2401-001363	C-AL;470uF,20%,16V,GP,TP,10x12.5mm,	
C201	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C202	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5mm	
C203	2401-000660	C-AL;2.2uF,20%,50V,GP,TP,5x11mm,5mm	
C204	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11mm,5mm	
C205	2305-000411	C-FILM,MPEF;470nF,5%,50V,TP,7.3x4.8x5.5mm,	
C206	2305-000411	C-FILM,MPEF;470nF,5%,50V,TP,7.3x4.8x5.5mm,	
C207	2305-000196	C-FILM,MPEF;150nF,5%,63V,TP,-,5mm	
C208	2401-000027	C-AL;4.7uF,20%,50V,GP,TP,5x11mm,5mm	
C209	2202-000794	C-CERAMIC,MLC-AXIAL;18pF,5%,50V,CH,TP,3.5x19mm,-	
C210	2301-000264	C-FILM,PEF;4.7nF,5%,50V,TP,6.5X5.5X3.0X5,	
C211	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C212	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C213	2201-000273	C-CERAMIC,DISC;18pF,5%,50V,CH,TP,5x3mm,5	
C214	2301-000285	C-FILM,PEF;47nF,5%,50V,TP,7.5x4.0x6.5,5mm	
C215	2301-000380	C-FILM,PEF;10nF,5%,50V,TP,6.5x3mm,5mm	
C216	2305-000288	C-FILM,MPEF;220nF,5%,50V,TP,7.3x4.8x5.5mm,	
C217	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C219	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11mm,5mm	
C221	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C222	2401-000440	C-AL;10uF,20%,25V,GP,TP,5x11mm,5mm	
C224	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C226	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C228	2201-000247	C-CERAMIC,DISC;15pF,5%,50V,CH,TP,5x3,5	
C230	2401-001495	C-AL;47uF,20%,16V,GP,TP,5x11mm,5mm	
C231	2401-000416	C-AL;10uF,20%,16V,GP,TP,5x11,5mm	
C232	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5mm	
C238	2401-001495	C-AL;47uF,20%,16V,GP,TP,5x11mm,5mm	
C239	2305-000288	C-FILM,MPEF;220nF,5%,50V,TP,7.3x4.8x5.5mm,	
C240	2305-000665	C-FILM,MPEF;100nF,5%,63V,TP,7.5x4.0x5.0mm,	
C247	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5P,TP,2.2x3.	
C248	2309-000138	C-FILM,PE-PPF;100nF,5%,50V,TP,20x16x8.5,7.5m	
C249	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11mm,5mm	
C250	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C251	2301-000204	C-FILM,PEF;2.7nF,5%,50V,TP,7.4x3.9x13mm,5	
C252	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C253	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C254	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C255	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C301	2202-000253	C-CERAMIC,MLC-AXIAL;4.7nF,20%,16V,Y5R,TP,1.9x3.5,7	
C302	2202-000253	C-CERAMIC,MLC-AXIAL;4.7nF,20%,16V,Y5R,TP,1.9x3.5,7	
C303	2401-003028	C-AL;100uF,20%,25V,WT,TP,6.3x11,5mm	
C304	2401-000903	C-AL;22uF,20%,160V,WT,TP,10x20mm,5m	
C305	2305-000178	C-FILM,MPEF;10nF,5%,100V,TP,-,5mm	
C306	2305-000407	C-FILM,MPEF;470nF,5%,100V,TP,-,5mm	
C307	2305-000407	C-FILM,MPEF;470nF,5%,100V,TP,-,5mm	
C308	2305-000450	C-FILM,MPEF;56nF,5%,100V,TP,-,5mm	
C401	2301-000380	C-FILM,PEF;10nF,5%,50V,TP,6.5x3mm,5mm	
C402	2201-000599	C-CERAMIC,DISC;560pF,10%,500V,Y5P,TP,7x4,5	
C403	2201-000556	C-CERAMIC,DISC;470pF,10%,500V,Y5P,TP,7x4,5	
C404	2401-001998	C-AL;1000uF,20%,25V,GP,TP,10x20,5mm	
C408	2401-001530	C-AL;47uF,20%,25V,GP,TP,5x11mm,5mm	
C409	2306-000253	C-FILM,MPPF;7.2nF,5%,1.6KV,TP,28.5x18.5x12	
C410	2201-000406	C-CERAMIC,DISC;270pF,10%,2KV,Y5P,TP,8x6,7.5	
C411	2401-000927	C-AL;22uF,20%,250V,GP,TP,13x20mm,5m	
C413	2305-000382	C-FILM,MPEF;4.7nF,5%,400V,TP,-,5mm	
C414	2301-001065	C-FILM,MPPF;47nF,5%,630V,TP,19x15.5x7,7.5	
C415	2401-000560	C-AL;1uF,20%,160V,GP,TP,6.3*11,5mm	
C416	2306-000204	C-FILM,MPPF;430nF,5%,400V,TP,26x20.5x12.5,	
C417	2201-000556	C-CERAMIC,DISC;470pF,10%,500V,Y5P,TP,7x4,5	
C418	2401-000384	C-AL;10uF,20%,100V,GP,TP,6.3x11,5mm	
C419	2201-000984	C-CERAMIC,DISC;680pF,10%,2KV,Y5P,TP,11x6,7.5m	
C502	2301-000213	C-FILM,PEF;220nF,5%,250V,TP,21.5x11,7.5	
C503	2201-002063	C-CERAMIC,DISC;10nF,+80-20%,3KV,Y5V,TP,16x5,7	
C504	2401-001232	C-AL;4.7uF,20%,250V,GP,TP,10x12.5mm	
C506	2401-000430	C-AL;10uF,20%,250V,GP,TP,10x16mm,5m	
C601	2202-000210	C-CERAMIC,MLC-AXIAL;270pF,10%,50V,Y5P,TP,1.9x3.5,7	
C602	2401-000939	C-AL;22uF,20%,25V,GP,TP,5x11mm,5	
C603	2301-000264	C-FILM,PEF;4.7nF,5%,50V,TP,6.5X5.5X3.0X5,	
C604	2401-001323	C-AL;470nF,20%,50V,BP,TP,5x11,5mm	
C610	2401-001998	C-AL;1000uF,20%,25V,GP,TP,10x20,5mm	
C613	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C614	2202-000210	C-CERAMIC,MLC-AXIAL;270pF,10%,50V,Y5P,TP,1.9x3.5,7	
C702	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C703	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C704	2202-000121	C-CERAMIC,MLC-AXIAL;100pF,10%,50V,Y5P,TP,1.9x3.5,-	
C705	2401-001264	C-AL;4.7uF,20%,50V,BP,TP,5x11,5mm	
C706	2401-001264	C-AL;4.7uF,20%,50V,BP,TP,5x11,5mm	
C800	2301-001096	C-FILM,MPEF;470nF,20%,275V,BK,26.5x11x20.5	
C801	2401-002213	C-AL;150uF,+30-10%,450V,GP,BK,25x35	
C802	2401-002284	C-AL;33uF,20%,50V,GP,TP,5x11mm,5mm	
C803	2301-000224	C-FILM,PEF;22nF,5%,50V,TP,7.4x3.9x13mm,5m	
C804	2301-000310	C-FILM,PEF;68nF,5%,50V,TP,8.0X8.5X4.0X5,5	
C805	2303-000163	C-FILM,PPF;2.2nF,5%,800V,TP,15x13x8.5,7.5	
C806	2201-000446	C-CERAMIC,DISC;3.3nF,20%,400V,Y5U,TP,18x8,10m	
C807	2201-000991	C-CERAMIC,DISC;560pF,10%,2KV,Y5P,TP,13x7,7.5	
C808	2401-000262	C-AL;100uF,20%,160V,HR,TP,16x25,7.5	
C809	2401-002290	C-AL;47uF,20%,160V,GP,TP,13x20mm,5m	
C810	2201-000991	C-CERAMIC,DISC;560pF,10%,2KV,Y5P,TP,13x7,7.5	
C811	2401-003141	C-AL;2200uF,20%,25V,WT,TP,13x25,5mm	
C812	2201-000373	C-CERAMIC,DISC;220pF,5%,50V,CH,TP,12.5x3,5	
C814	2301-000192	C-FILM,PEF;1nF,5%,50V,TP,5.3x10mm,5mm	
C815	2401-000808	C-AL;220uF,20%,16V,GP,TP,8x11mm,5mm	
C816	2401-000603	C-AL;1uF,20%,50V,GP,TP,5x11mm,5mm	
C818	2401-001495	C-AL;47uF,20%,16V,GP,TP,5x11mm,5mm	
C819	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5mm	
C901	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5mm	
C902	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C904	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C905	2401-001333	C-AL;470nF,20%,50V,GP,TP,5x11,5	
C907	2201-000119	C-CERAMIC,DISC;100nF,+80-20%,50V,Y5V,TP,8x3.5	
C908	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
C909	2201-000193	C-CERAMIC,DISC;10pF,0.3pF,50V,CH,TP,5x3,5	
C910	2301-000530	C-FILM,PEF;100nF,5%,100V,TP,11.5x12.5x6.5	
C911	2401-002235	C-AL;10uF,20%,16V,GP,TP,5x11mm,5mm	
C912	2201-000234	C-CERAMIC,DISC;150pF,5%,50V,CH,TP,9.5x3,5	
C913	2301-000108	C-FILM,PEF;1.5nF,5%,50V,TP,6.5x3.0x5.5mm,	
C914	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C915	2306-000122	C-FILM,MPPF;100nF,5%,50V,TP,7.3x4.0x5.0mm,	
C916	2301-000264	C-FILM,PEF;4.7nF,5%,50V,TP,6.5X5.5X3.0X5,	
C917	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5P,TP,2.2x3.	
C919	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C920	2401-000480	C-AL;10uF,20%,50V,GP,TP,5x11,5	
C922	2201-000573	C-CERAMIC,DISC;47pF,5%,50V,CH,TP,6.5x3.0,5	
C923	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5P,TP,2.2x3.	
C924	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5P,TP,2.2x3.	
C926	2202-000796	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,TP,3.5x19,-	
C927	2201-000573	C-CERAMIC,DISC;47pF,5%,50V,CH,TP,6.5x3.0,5	
CA01	2401-001264	C-AL;4.7uF,20%,50V,BP,TP,5x11,5mm	
CN501	AA39-20109B	LEAD-CONNECTOR,ASSY;-,YBNH025-08,S,8P,500,1007#26	
CN603	3711-002643	CONNECTOR-HEADER;BOX,4P,1R,2.5mm,STRAIGHT,-	
CN802	AA27-20003Y	COIL-DEGAUSSING;-,20,15.2ohm,28T,L2170,E	
CW901	2503-000156	C-NETWORK;100pFx4,20%,50V	
D201	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D202	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D205	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D208	2001-000633	R-CARBON;30Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
D209	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D210	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D211	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D213	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D401	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D402	0402-000132	DIODE-RECTIFIER;1N4004,400V,1A,DO-41,TP	
D403	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D404	0402-000534	DIODE-RECTIFIER;RG10V,400V,1.2A,DO-201,TP	
D405	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D406	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D501	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204	

Loc. No.	Code No.	Description ; Specification	Remark
D502	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D503	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D504	0402-001105	DIODE-RECTIFIER;ERB43-04SV1,400V,1.0A,-,TP	
D701	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D800	1405-000152	VARISTOR;560V,2500A,14x8.5mm,TP	
D801	0402-000102	DIODE-BRIDGE;D2SB60,600V,1.5A,-	
D802	0402-000540	DIODE-RECTIFIER;RU20A,600V,1.5A,-	
D803	0402-000430	DIODE-RECTIFIER;FML-G02S,200V,3.0A,TO-220F,BK	
D803	0402-000430	DIODE-RECTIFIER;FML-G02S,200V,3.0A,TO-220F,BK	
D804	0402-000213	DIODE-RECTIFIER;ERB12-06,600V,1.0A,DO-41	
D809	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D810	0402-000216	DIODE-RECTIFIER;ERC24-06,600V,1.0A,DO-204	
D901	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D903	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D905	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D906	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D907	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D908	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
D910	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
DA01	0401-000005	DIODE-SWITCHING;1N4148,75V,300mA,DO-35,TP	
DZ201	0403-000295	DIODE-ZENER;MTZ5.1B,5.1V,4.94-5.20V,500mW,	
DZ202	0403-000551	DIODE-ZENER;MTZ3.9B,3.9V,3.89-4.16V,500mW,	
DZ203	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ204	2001-000812	R-CARBON;5.6Kohm,5%,1/8W,AA,TP,1.8x3.2m	
DZ205	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ208	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ301	0403-000660	DIODE-ZENER;MTZ22A,22V,20.15-21.2V,500mW,D	
DZ302	0403-001039	DIODE-ZENER;MA2560,56V,52-60V,1W,DO-41,TP	
DZ401	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ402	0403-000698	DIODE-ZENER;TZP12A,12V,11.4-12.6V,1W,DO-41	
DZ501	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ502	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ503	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ504	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ701	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ702	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ703	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ704	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ705	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ802	0403-000297	DIODE-ZENER;MTZ6.2B,6.2V,5.96-6.27V,500mW,	
DZ803	1203-001217	IC-POSI.ADJUST REG.;431,TO-92,3P,4.58MIL,PLASTIC,2	
DZ808	0403-000300	DIODE-ZENER;MTZ8.2B,7.78-8.19V,500mW,DO-34	
DZ809	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ901	0403-000563	DIODE-ZENER;MTZ9.1B,9.1V,8.57-9.01V,500mW,	
DZ902	0403-000295	DIODE-ZENER;MTZ5.1B,5.1V,4.94-5.20V,500mW,	
DZ903	1203-000451	IC-VOLTAGE REGULATOR;33,TO-92,3P,-,PLASTIC,31/35V,2	
DZ905	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ907	0403-000296	DIODE-ZENER;MTZ5.6B,5.6V,5.45-5.73V,500mW,	
DZ909	0403-000551	DIODE-ZENER;MTZ3.9B,3.9V,3.89-4.16V,500mW,	
⚠ F801	3601-000261	FUSE-FERRULE;250V,3.15A,TIME LAG,GLASS,5x20	
F801A	3602-000114	FUSE-HOLDER;-,-,30mohm	
F801B	3602-000114	FUSE-HOLDER;-,-,30mohm	
⚠ F802	3601-001086	FUSE-FERRULE;125V,5A,QUICK-ACTING,CERAMIC,2	
⚠ IC201	1204-001386	IC-VIDEO SYSTEM;TDA8842,DIP,56P,300MIL,PLASTIC	
⚠ IC301	1204-000441	IC-IF CIRCUIT;TDA8356,SIP,9P,-,PLASTIC,40V,-	
⚠ IC501	1201-001159	IC-VIDEO AMP;6107,ZIP,9P,300MIL,SINGLE,-,PL	
⚠ IC601	1201-001147	IC-AUDIO AMP;7056B,SIP,9P,-,SINGLE,41.5dB,P	
⚠ IC801	1203-001494	IC-PWM CONTROLLER;3S0680RF,TO3PF-5L,5,210,PLASTI	
⚠ IC802	1203-000644	IC-POSI.FIXED REG.;7630,SIP,10P,-,PLASTIC,5.1/8V,	
⚠ IC901	AA13-30019U	IC-MCU;-,Z90203-R3729,8BIT,SDIP,CS-53	
⚠ IC902	1103-001105	IC-EEPROM;24C040,512x8BIT,DIP,8P,300MIL,	
J185	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
JS701	3722-000183	JACK-SCART;21P,4mm,SN,BLK,NO	
L102	2701-000212	INDUCTOR-AXIAL;68uH,10%,2.8x7mm	
L103	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L202	2701-000168	INDUCTOR-AXIAL;3.3uH,5%,2.5x3.4mm	
L206	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L301	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L302	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
L304	2701-000159	INDUCTOR-AXIAL;22uH,10%,4.2x9.8mm	
L305	2701-000116	INDUCTOR-AXIAL;10uH,10%,4.2x9.8mm	
L306	2701-000115	INDUCTOR-AXIAL;10uH,10%,2.8x7mm	
L401	AA27-30001B	COIL-LINEARITY;-,195uH,QIC1010,PI0.4,4.5x21.5	
L402	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
L601	2701-000146	INDUCTOR-AXIAL;2.2uH,10%,2.5x3.4mm	
L702	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
L703	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
L704	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
L706	2701-000184	INDUCTOR-AXIAL;4.7uH,10%,2.5x3.4mm	
L801	AA29-30001G	FILTER-LINE;-,27mH,0.6A,-,-	
L804	3301-000287	CORE-FERRITE BEAD;AA,3.5x1.0x6.0mm,1500,2400G	
L805	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
L807	2901-000297	FILTER-EMI ON BOARD;-,3A,-,-,3.5x5,TP,-	
L809	2701-001032	INDUCTOR-AXIAL;100uH,10%,5x14mm	
L810	2701-001032	INDUCTOR-AXIAL;100uH,10%,5x14mm	
L902	2701-000189	INDUCTOR-AXIAL;470nH,10%,2.5x3.4mm	
L904	2701-000299	INDUCTOR-AXIAL;13uH,10%,2.5x3.4mm	
LD901	AA96-30007A	ASSY-LED,GUIDE;-,AA61-50055A,DL-G7GA,GREEN	
NT801	1404-000187	THERMISTOR-NTC;4.7ohm,15%,2800K,27.2mW/C,TP	
P801	1404-001048	THERMISTOR-PTC;7ohm,30%,200/220V,270V,19A,-,B	
PC801	0604-001038	PHOTO-COUPLER;TR,130-260%,200mW,DIP-4,ST	
Q201	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q202	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q204	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
⚠ Q401	0502-001115	TR-POWER;KSC5386,NPN,50W,TO-3PF,ST,8-	
⚠ Q402	0501-000369	TR-SMALL SIGNAL;KSC2331-Y,NPN,1W,TO-92L,-,120-	
Q701	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q703	0501-000283	TR-SMALL SIGNAL;KSA539,PNP,400mW,TO-92,TP,120-	
Q901	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q902	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q903	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
Q904	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q905	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q906	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
Q907	0504-000125	TR-DIGITAL;KSR1012,NPN,300mW,47K,TO-92,TP	
Q908	0504-000123	TR-DIGITAL;KSR1010,NPN,300mW,10K,TO-92,TP	
QA01	0501-002183	TR-SMALL SIGNAL;KTC9014,NPN,625mW,TO-92,TP,100	
R200	2001-000780	R-CARBON;470ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R201	2001-000005	R-CARBON;390ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R202	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R203	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R204	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R207	2001-000008	R-CARBON;15Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R208	2001-000005	R-CARBON;390ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R209	2701-000114	INDUCTOR-AXIAL;10uH,10%,2.5x3.4mm	
R210	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R211	2001-000331	R-CARBON;12Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R212	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R213	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R214	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R215	2004-001995	R-METAL;9.1Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R216	2001-000490	R-CARBON;200ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R217	2001-000449	R-CARBON;2.2Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R218	2001-000591	R-CARBON;3.3Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R219	2001-000008	R-CARBON;15Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R221	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R223	2004-001205	R-METAL;68ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R224	2001-000563	R-CARBON;27Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R225	2001-000554	R-CARBON;270ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R226	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R227	2004-001234	R-METAL;75Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R229	2001-000890	R-CARBON;6.8Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R230	2001-000793	R-CARBON;47ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R231	2001-000563	R-CARBON;27Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R232	2001-000356	R-CARBON;150Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R234	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R236	2003-000634	R-METAL OXIDE(S);3.9Kohm,5%,1W,AA,TP,3.3x9mm	
R237	2001-000793	R-CARBON;47ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R238	2001-000739	R-CARBON;4.7Mohm,5%,1/8W,AA,TP,1.8x3.2m	
R239	2001-000739	R-CARBON;4.7Mohm,5%,1/8W,AA,TP,1.8x3.2m	
R240	2001-000832	R-CARBON;510ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R241	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R242	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R251	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R252	2004-001914	R-METAL;39Kohm,2%,1/8W,AA,TP,1.8x3.5mm	
R262	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R301	2004-001983	R-METAL;2.49Kohm,1%,1/2W,AA,TP,2.4x6.4	
R302	2008-001033	R-FUSIBLE(S);10ohm,5%,2W,AF,TP,3.9x10mm	
R303	2001-000273	R-CARBON;100Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R305	2004-001370	R-METAL(S);1.3ohm,1%,1/2W,AA,TP,2.4x6.4mm	
R306	2008-000254	R-FUSIBLE(S);0.68ohm,5%,2W,AF,TP,3.9x10mm	
R307	2003-000649	R-METAL OXIDE(S);330ohm,5%,1W,AF,TP,3.3x9mm	
R308	2001-000020	R-CARBON(S);22ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R402	2008-000294	R-FUSIBLE(S);33ohm,5%,2W,AF,TP,3.9x10mm	

Loc. No.	Code No.	Description ; Specification	Remark
R403	2001-001114	R-CARBON(S);270ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R404	2008-000294	R-FUSIBLE(S);33ohm,5%,2W,AF,TP,3.9x10mm	
R405	2001-001410	R-CARBON(S);43ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R406	2001-000037	R-CARBON(S);330ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R407	2001-001037	R-CARBON(S);0.39ohm,5%,1/2W,AA,TP,2.4x6.4m	
R408	2001-000022	R-CARBON(S);33ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R409	2008-000204	R-FUSIBLE(S);0.22ohm,10%,1/2W,AF,TP,2.5x6.5	
R412	2008-000294	R-FUSIBLE(S);33ohm,5%,2W,AF,TP,3.9x10mm	
R413	2003-000784	R-METAL OXIDE(S);7.5Kohm,5%,2W,AF,TP,4x12mm	
R414	2003-000540	R-METAL OXIDE(S);1Kohm,5%,2W,AF,TP,4x12mm	
R415	2008-000206	R-FUSIBLE(S);1ohm,5%,1/2W,AF,TP,2.5x6.5mm	
R416	2008-000277	R-FUSIBLE;68ohm,5%,1/2W,AA,TP,4.7x11mm	
R417	2008-000256	R-FUSIBLE(S);1.5ohm,5%,2W,AA,TP,3.9x10mm	
R420	2004-002011	R-METAL(S);110Kohm,1%,1/2W,AA,TP,2.4x6.4m	
R501H	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm	
R502H	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm	
R503	2002-001008	R-COMPOSITION;1.8Kohm,5%,1/2W,AA,TP,3.7x9mm	
R504	2001-001062	R-CARBON(S);10Mohm,5%,1/2W,AA,TP,2.4x6.4mm	
R505	2008-001011	R-FUSIBLE(S);0.18ohm,10%,2W,AF,TP,3.9x10mm	
R510	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R511	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R512	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R603	2001-000241	R-CARBON;1.5Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R604	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R610	2001-000331	R-CARBON;12Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R611	2001-000723	R-CARBON;4.3Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R701	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R702	2001-000969	R-CARBON;75ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R703	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R705	2001-000003	R-CARBON;330ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R713	2001-000812	R-CARBON;5.6Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R714	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R715	2001-000812	R-CARBON;5.6Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R717	2001-000812	R-CARBON;5.6Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R801	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm	
R802	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x10mm	
R803	2001-001178	R-CARBON(S);680ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R805	2001-001070	R-CARBON(S);120ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R806	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
R807	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
R808	2001-000022	R-CARBON(S);33ohm,5%,1/2W,AA,TP,2.4x6.4mm	
R809	2001-000622	R-CARBON;300Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R810	2003-000527	R-METAL OXIDE(S);18Kohm,5%,2W,AA,TP,4x12mm	
R812	2003-000455	R-METAL OXIDE(S);100ohm,5%,2W,AA,TP,4x12mm	
R814	2008-001051	R-FUSIBLE;0.18ohm,10%,2W,AA,TP,3.9x10mm	
R816	2004-004089	R-METAL;123Kohm,1%,1/2W,AA,TP,2.5x6.5m	
R817	2004-001983	R-METAL;2.49Kohm,1%,1/2W,AA,TP,2.4x6.4	
R818	2004-001371	R-METAL(S);1.5Kohm,1%,1/2W,AA,TP,2.4x6.4m	
R819	2004-001390	R-METAL(S);1Kohm,2%,1/2W,AA,TP,2.4x6.4mm	
R820	2008-000299	R-FUSIBLE(S);47ohm,5%,2W,AF,TP,3.9x10mm	
R821	2008-000266	R-FUSIBLE(S);1ohm,5%,2W,AF,TP,3.9x10mm	
R822	2001-001150	R-CARBON(S);470Kohm,5%,1/2W,AA,TP,2.4x6.4m	
R823	2001-001150	R-CARBON(S);470Kohm,5%,1/2W,AA,TP,2.4x6.4m	
R825	2003-001040	R-METAL OXIDE(S);47Kohm,5%,2W,AF,TP,3.9x10mm	
R901	2001-000832	R-CARBON;510ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R902	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R903	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R904	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R905	2001-000241	R-CARBON;1.5Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R906	2001-000472	R-CARBON;2.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R907	2001-000995	R-CARBON;820ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R908	2001-000232	R-CARBON;1.3Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R909	2001-000605	R-CARBON;3.6Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R910	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R912	2004-001193	R-METAL;680ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R916	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R917	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R918	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R919	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R920	2001-000864	R-CARBON;56Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R921	2001-001062	R-CARBON(S);10Mohm,5%,1/2W,AA,TP,2.4x6.4mm	
R922	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R923	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R924	2001-000449	R-CARBON;2.2Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R925	2001-000449	R-CARBON;2.2Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R926	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R927	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R928	2001-000066	R-CARBON(S);10Kohm,5%,1/2W,AA,TP,2.4x6.4mm	
R929	2004-000253	R-METAL;11Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R930	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R931	2004-000218	R-METAL;10Kohm,1%,1/8W,AA,TP,1.8x3.2mm	
R934	2001-000449	R-CARBON;2.2Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R936	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R937	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R938	2001-000472	R-CARBON;2.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R940	2001-000660	R-CARBON;33Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R946	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R947	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R948	2001-000241	R-CARBON;1.5Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R951	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R952	2001-000281	R-CARBON;100ohm,5%,1/8W,AA,TP,1.8x3.2mm	
R954	2001-000006	R-CARBON;2.4Kohm,5%,1/8W,AA,TP,1.8x3.2m	
R955	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R956	2001-000429	R-CARBON;1Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R960	2001-000290	R-CARBON;10Kohm,5%,1/8W,AA,TP,1.8x3.2mm	
R962	2001-000273	R-CARBON;100Kohm,5%,1/8W,AA,TP,1.8x3.2m	
RA01	2004-001193	R-METAL;680ohm,5%,1/8W,AA,TP,1.8x3.2mm	
RA02	2001-000241	R-CARBON;1.5Kohm,5%,1/8W,AA,TP,1.8x3.2m	
RA03	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
RA04	2001-000734	R-CARBON;4.7Kohm,5%,1/8W,AA,TP,1.8x3.2m	
RL901	AA59-60001U	MODULE-REMOCON;-,ORC-50VF/SR-12V,38KHz,940nm,	
RW701	2011-001133	R-NETWORK;33K/24K/75x3,5%,1/8W,X,SIP,6P,	
RW702	2011-001098	R-NETWORK;75/75/1K/75ohm,5%,-,-,PLCC,5P,	
RX801	2002-001011	R-COMPOSITION;3.3Mohm,10%,1/2W,AA,TP,3.7x9mm	
SFN02	2904-001063	FILTER-SAW AV;38.9MHz,SIP5K,TP,17dB,PAL-B/G,	
SW801	3403-000175	SWITCH-PUSH;250V,5A,DPST,-,ESB-99835V	
SW901	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW902	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW903	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW904	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
SW905	3404-000244	SWITCH-TACT;15V,20mA,90-170gf,7.5x7mm,SPST	
⚠ T401	AA26-50001B	HORIZ.DRIVE;-,7.1mH,102uH,10-20uH,YL081,ST	
⚠ T444	AA26-30001Y	TRANS-FLYBACK;-,FSV-20A001,20,125V	
⚠ T801	AA26-20007Q	TRANS-SWITCHING;-,180-260V,125V/12.5V,EN,EER28	
⚠ TU01	AA40-10006Q	TUNER-V/S;TELE4-125A,PAL-B/G,TR,181CH	
⚠ V999	3704-001090	SOCKET-CRT;9P,15.24PI,26.5PI,SN,-	
X202	2801-000226	CRYSTAL-UNIT;3.579545MHz,20ppm,28-AAM,15pF,	
X203	2801-000274	CRYSTAL-UNIT;4.433619MHz,30ppm,28-AAM,20pF,	
X901	2801-000724	CRYSTAL-UNIT;6MHz,50ppm,28-AAM,20pF,40ohm,T	
Z201	2903-000199	FILTER-CERAMIC;TR,6.5MHz,70KHz,-,-,TP,-	
Z202	2903-000181	FILTER-CERAMIC;TR,5.5MHz,-,-,-,TP,TPS5.5MB-TF	
Z204	2903-000184	FILTER-CERAMIC;BP,5.5MHz,+-60KHz,6dB,-,TP,-	
Z205	2903-000202	FILTER-CERAMIC;BP,6.5MHz,+-80KHz,6dB,-,TP,-	
Z206	2903-000184	FILTER-CERAMIC;BP,5.5MHz,+-60KHz,6dB,-,TP,-	
Z210	2903-000200	FILTER-CERAMIC;BP,6.5MHz,+-70KHz,6dB,-,TP,-	

ASSY-CRT

⚠	AA03-10029W	CRT-COLOR;-,A48KRD82X(H),+380mG,20,90de
⚠	AA27-50004W	DEFLECTION-YOKE;-,DSE-1992LL(1H),20/A48KRD82X
	AA27-60001D	MAGNET-CONVERGENCE;-,JH-291-(JH-8210),29.1mm
	AA63-60028A	SPACER-DY;NEOPRENE,-,BLK,V0 W12,-,-

ASSY-POWER,CORD

⚠	AA39-10001G	POWER-CORD;-,KKP-419C,KLCE-2F,2.286m,HOUS
	AA61-20284A	HOLDER;-,P-CORD,PP,VO,BLK,KE-002

REMOCON

*	AA59-10095W	REMOCON;-,TM59,SS,SZM173EA,24,-,-,L/GR

ASSY-SPEAKER

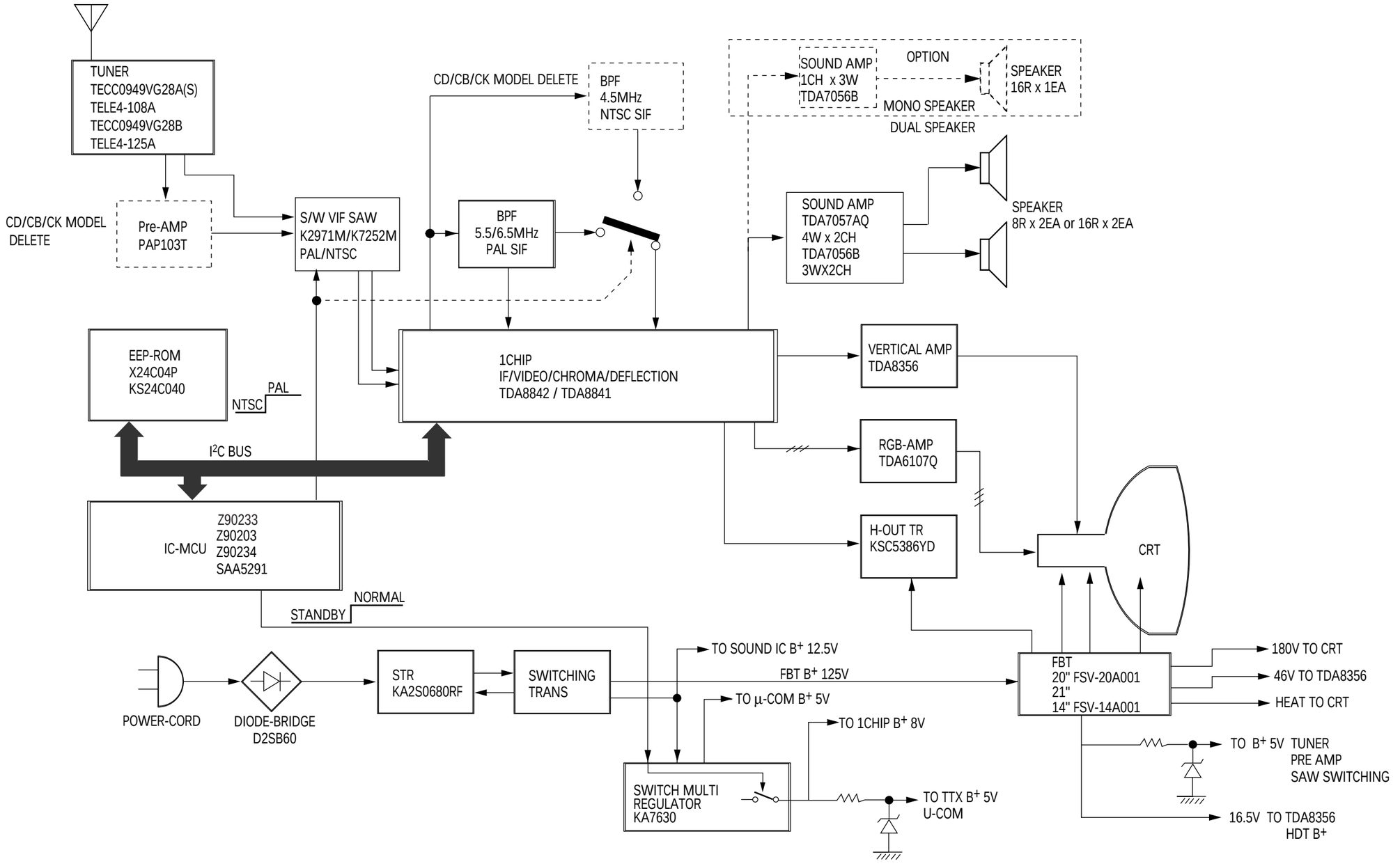
	3001-000191	SPEAKER;3W,8ohm,90dB,180Hz
	AA39-20505M	LEAD CONNECTOR-ASSY;-,YSH025-04,REC,4P,350,700mm,1

ASSY-ACCESSORY

	6801-000102	WARRANTY CARD;RUSSIA,1
	AA26-90001C	TRANS-MATCHING;-,300ohm/75ohm,PAL,40-890MHz
	AA42-10001V	ANT-ROD;-,3S,620mm,BRN,UL/CSA
	AA68-11259A	MANUAL-USERS;S15A,RUSSIAN,W/O TTX,B5,W/P 10

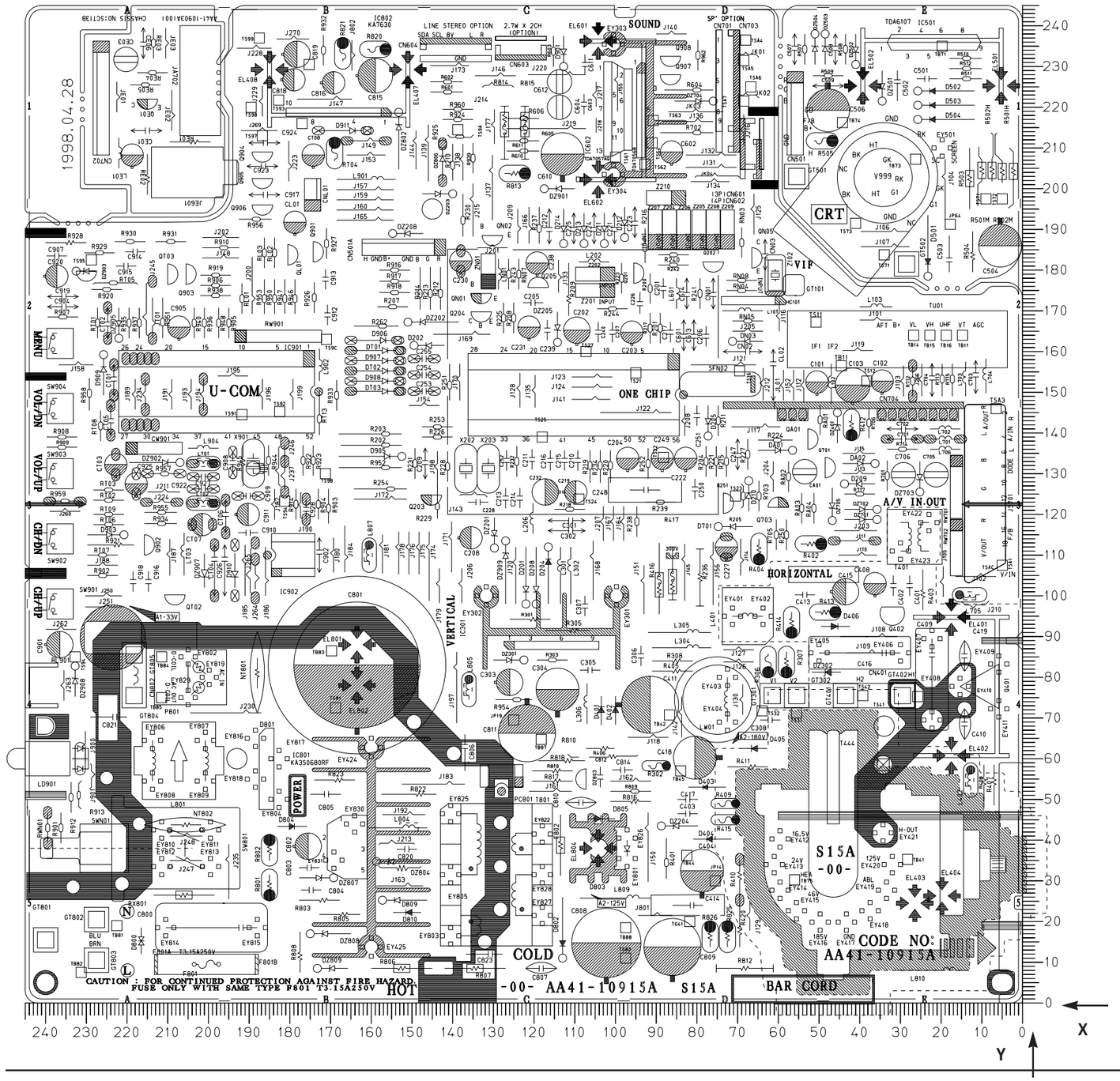
8. Block Diagram

8-1 S15A



10. PCB Layout

10-1 PCB Main

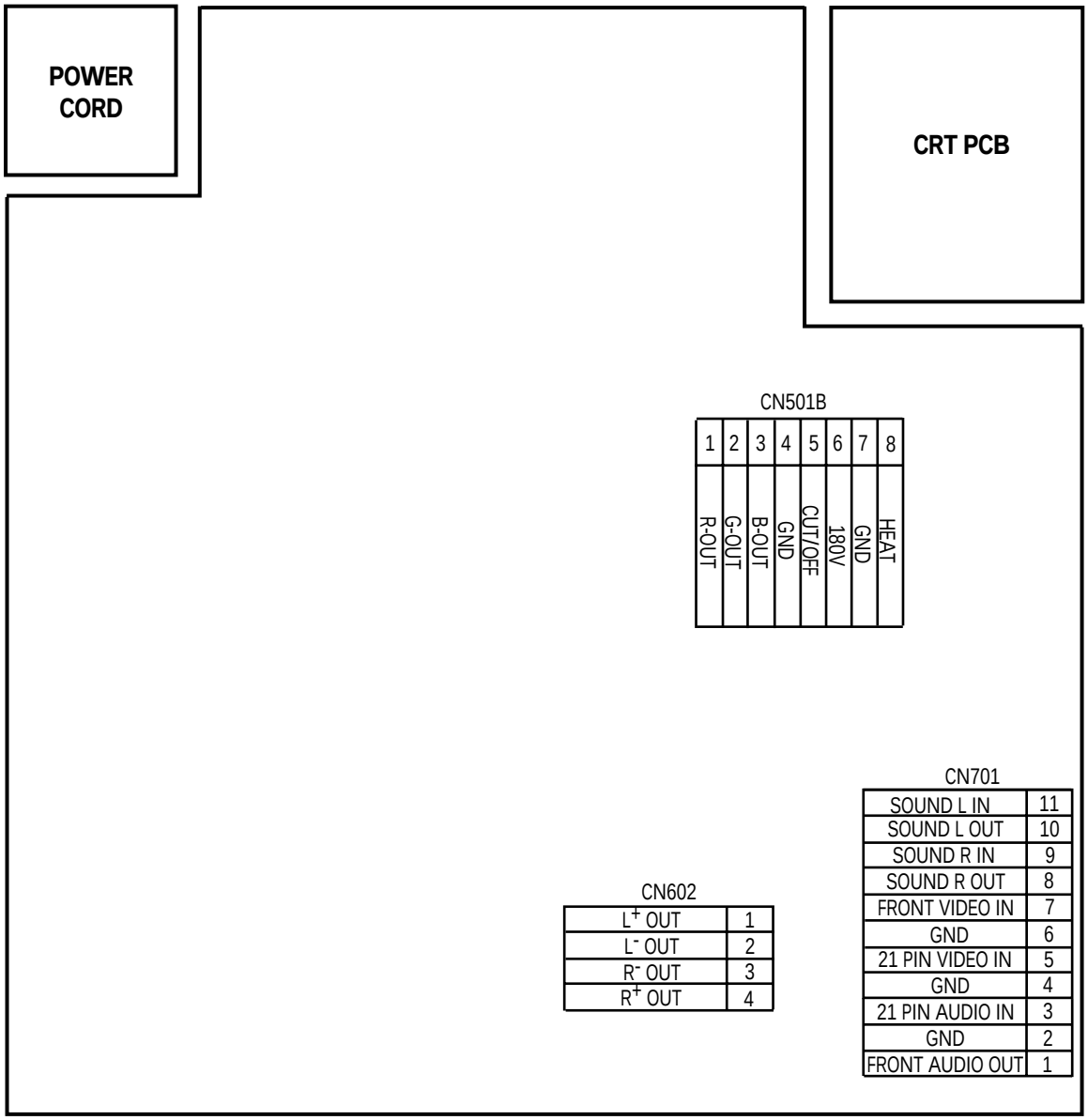


Loc. No.	X	Y
DIODE		
D201	122	98
D202	149	161
D204	116	112
D205	77	139
D208	119	98
D209	43	127
D210	67	128
D211	102	186
D212	97	188
D213	107	186
D214	112	186
D401	103	78
D402	100	78
D403	84	53
D404	83	40
D405	72	62
D406	39	92
D501	23	178
D502	25	224
D503	25	220
D504	25	217
D701	74	117
D800	216	19
D801	188	65
D802	113	11
D803	104	38
D805	97	45
D809	157	25
D810	157	22
D901	112	230
D903	220	115
D905	152	134
D906	153	162
D907	153	157
D908	153	152
D909	225	159
D910	193	100
D911	161	214
DA01	56	135
DA02	36	132
DN03	71	162
DT01	153	160
DT02	153	155
DT03	153	150
DZ201	129	111
DZ202	151	167
DZ203	140	198
DZ204	88	43
DZ205	114	162
DZ208	154	189
DZ301	122	84
DZ302	54	81
DZ401	45	145
DZ501	34	221
DZ502	41	230
DZ503	48	238
DZ504	51	238
DZ701	35	118
DZ702	35	121
DZ703	25	125
DZ704	76	221

Loc. No.	X	Y
DZ705	46	118
DZ802	153	218
DZ803	107	57
DZ804	158	34
DZ806	142	211
DZ807	169	30
DZ808	175	17
DZ809	173	8
DZ901	117	200
DZ902	207	132
DZ903	232	179
DZ905	222	163
DZ907	201	100
DZ908	232	82
DZ909	127	113
IC		
HC101	59	172
IC201	86	141
IC301	99	100
IC501	39	225
IC602	100	235
IC801	160	13
IC802	151	229
IC901	175	142
IC902	183	114
TRANSISTOR		
Q201	95	176
Q202	78	182
Q203	147	124
Q204	135	169
Q205	116	175
Q251	73	120
Q401	17	94
Q402	34	95
Q701	48	129
Q703	57	121
Q901	174	182
Q902	215	110
Q903	205	176
Q904	189	209
Q905	189	202
Q906	189	196
Q907	89	228
Q908	89	232
QA01	52	136
QE01	217	222
QL01	180	181
QN01	135	174
QN02	132	188
QN05	66	180
QT02	210	100
QT03	210	176

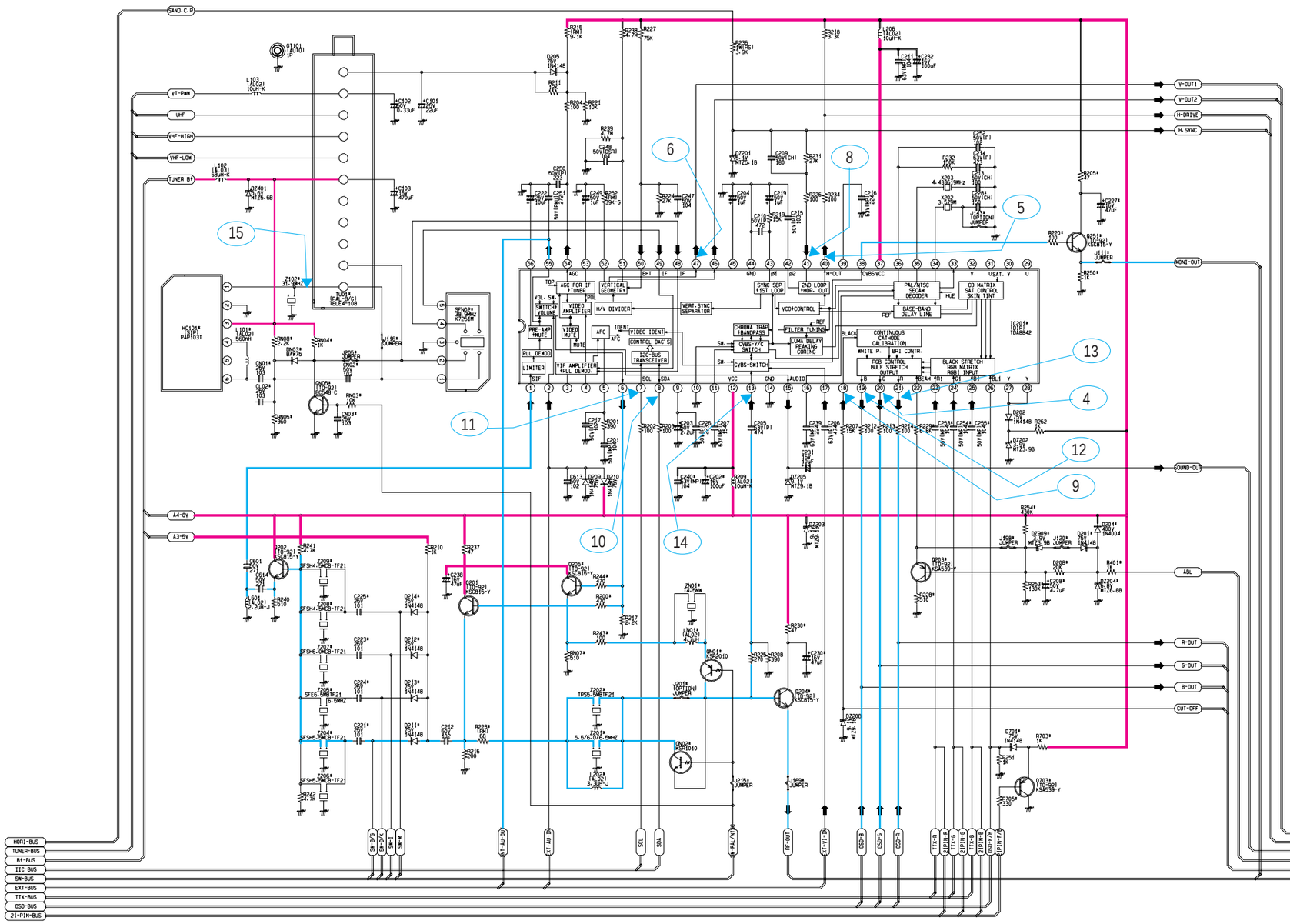
10. Wiring Diagram

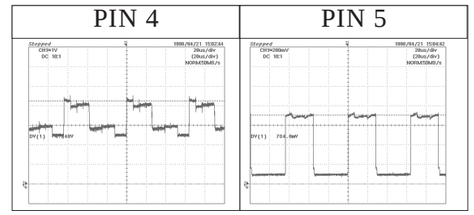
10-1 S15A

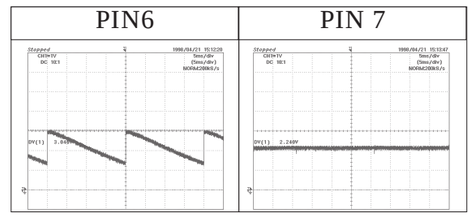


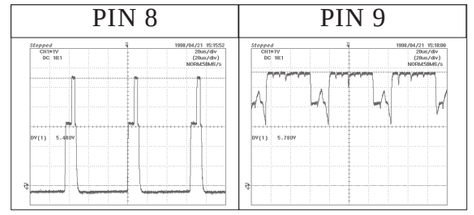
11. Schematic Diagrams

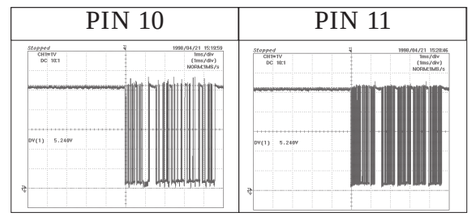
11-1 ONECHIP

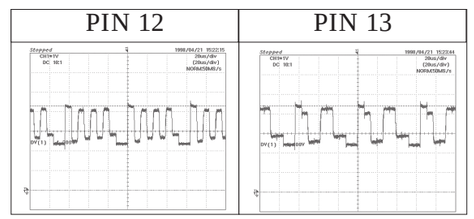


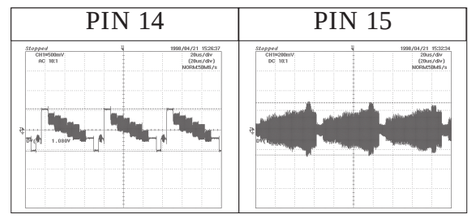




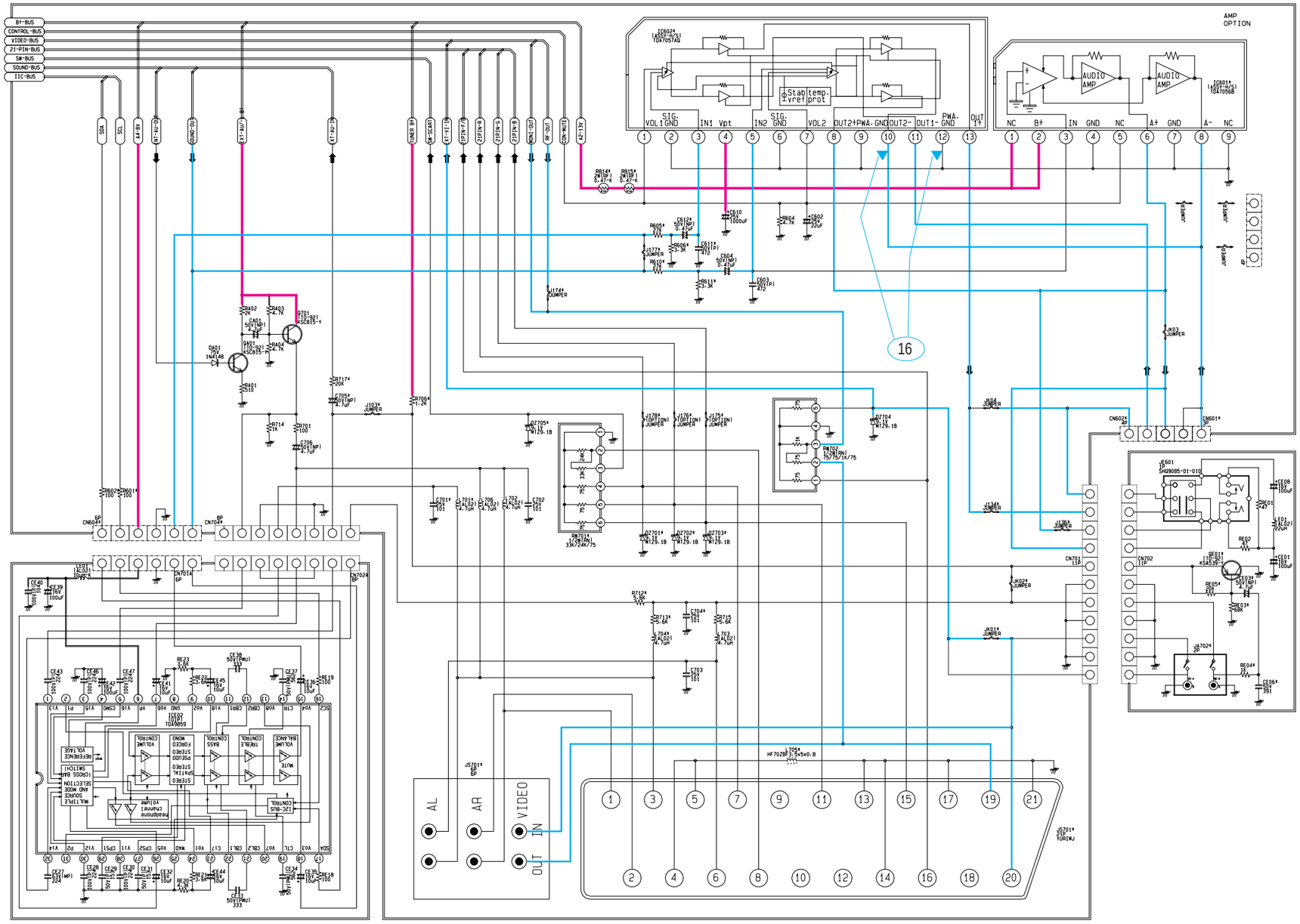




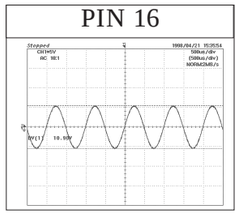




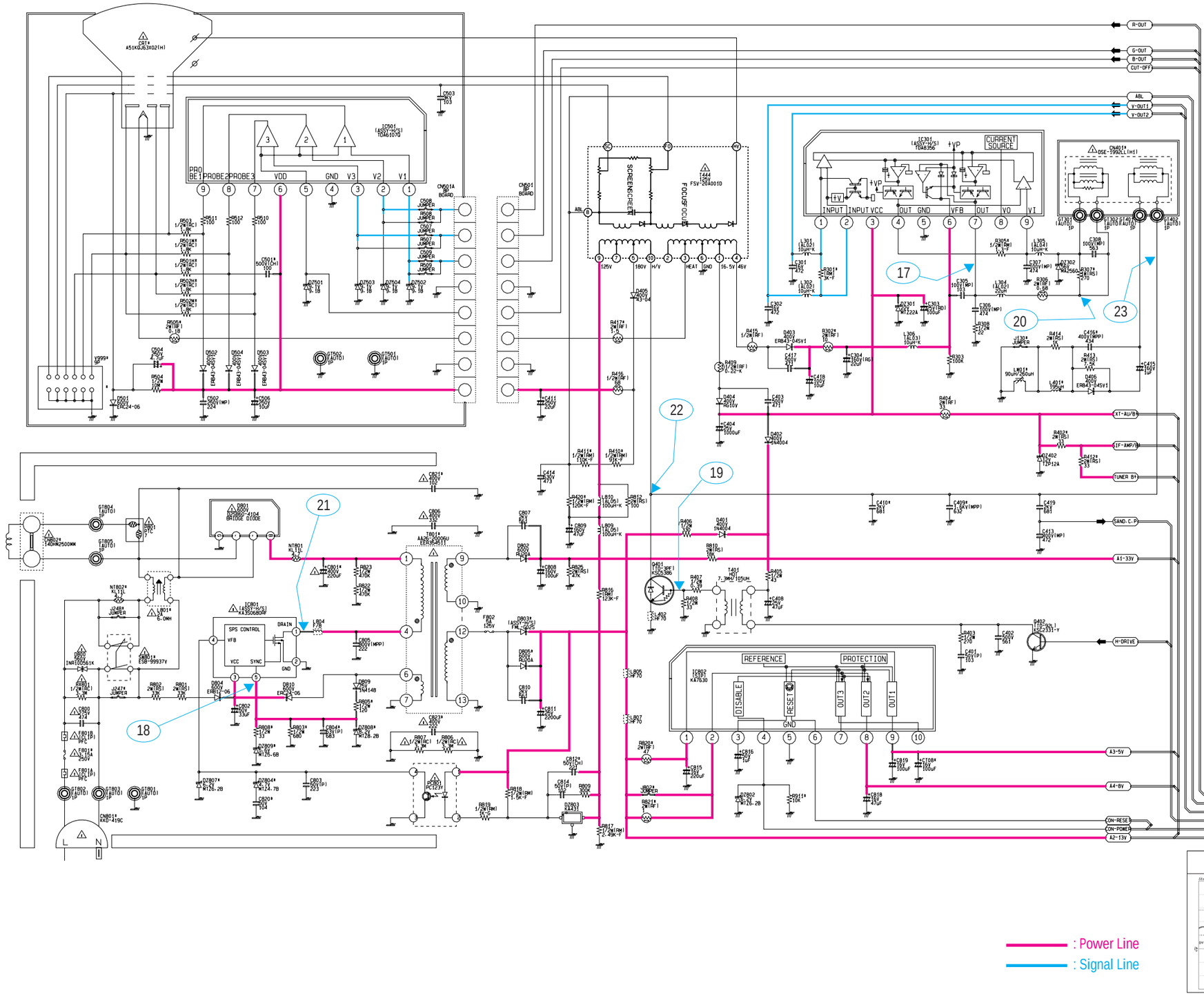
11-2 SOUND, EXT-A/V



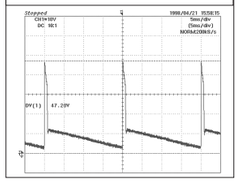
PIN 16



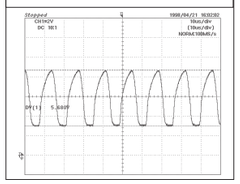
11-3 POWER / CRT / VERICAL / HORZIONTAL



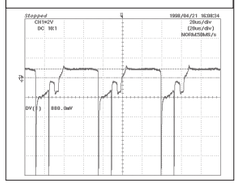
PIN 17



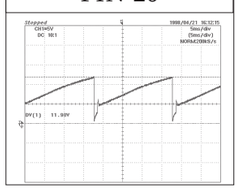
PIN 18



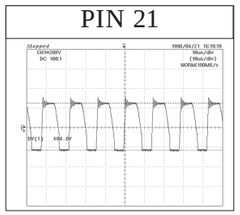
PIN 19



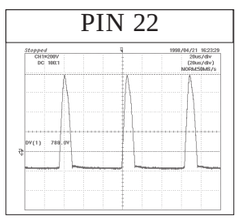
PIN 20



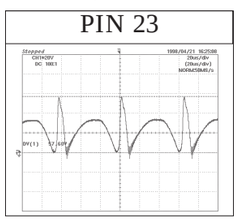
PIN 21



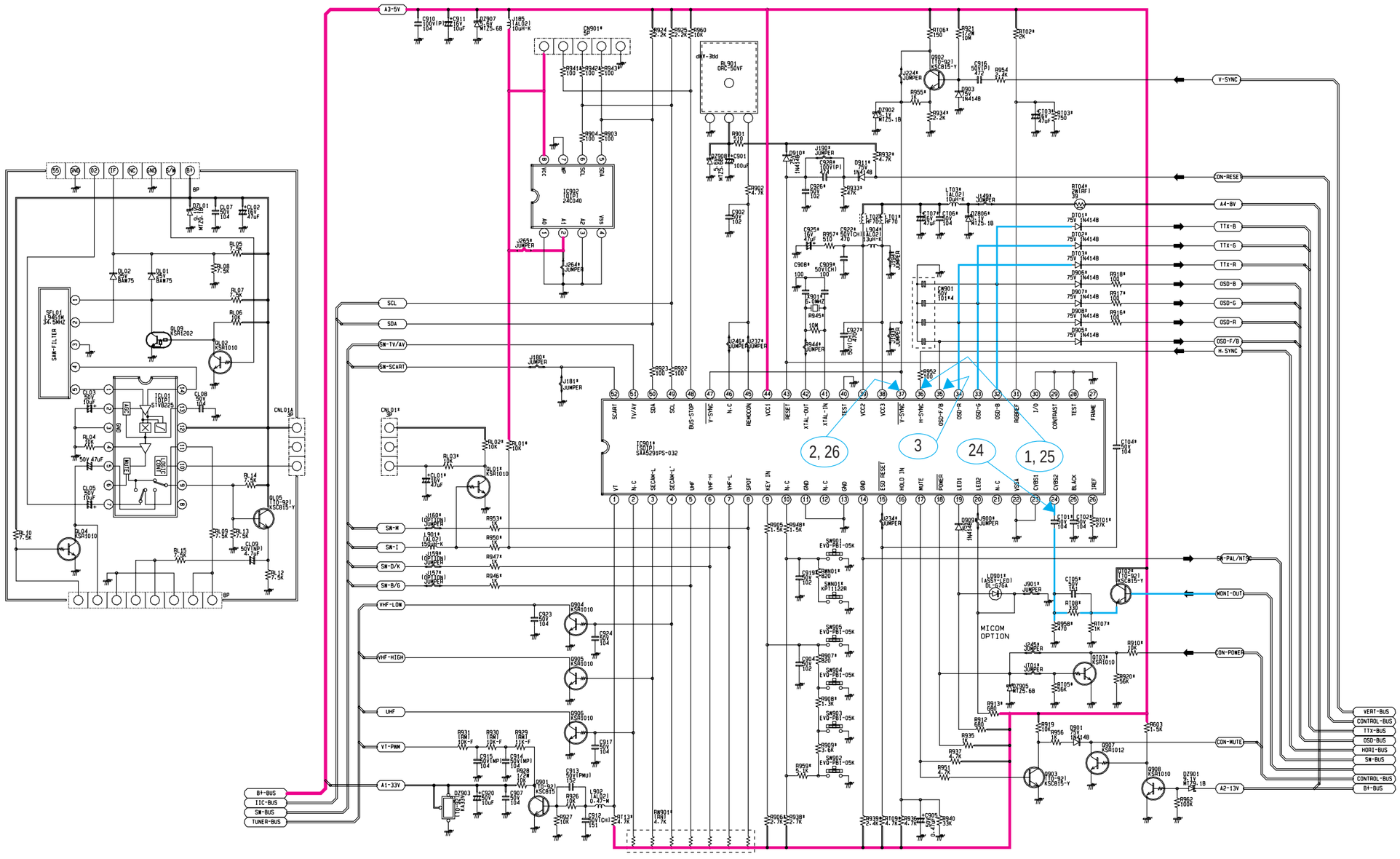
PIN 22



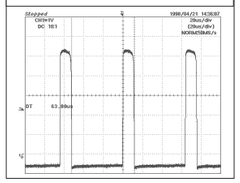
PIN 23



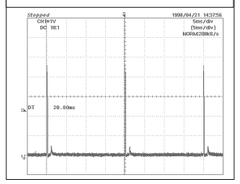
11-4 MICOM (NON-TTX,TTX)



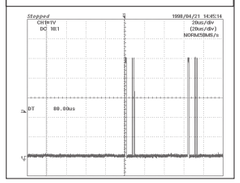
NON-TTX PIN 1



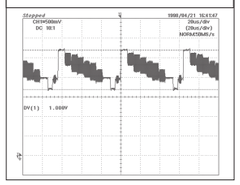
NON-TTX PIN 2



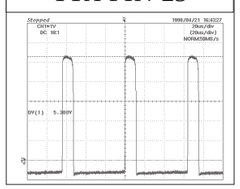
NON-TTX PIN 3



TTX PIN 24



TTX PIN 25



TTX PIN 26

: Power Line

: Signal Line

1. Precautions

Follow these safety, servicing and ESD precautions to prevent damage and protect against potential hazards such as electrical shock and X-rays.

1-1 Safety Precautions

1. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

2. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.

3. Make sure that there are no cabinet openings through which people—particularly children—might insert fingers and contact dangerous voltages. Such openings include the spacing between the picture tube and the cabinet mask, excessively wide cabinet ventilation slots, and improperly fitted back covers.

   If the measured resistance is less than 1.0 megohm or greater than 5.2 megohms, an abnormality exists that must be corrected before the unit is returned to the customer.

4. Leakage Current Hot Check (Figure 1-1):
   Warning: Do not use an isolation transformer during this test. Use a leakage-current tester or a metering system that complies with American National Standards Institute (ANIS C101.1, Leakage Current for Appliances), and Underwriters Laboratories (UL Publication UL1410, 59.7).

5. With the unit completely reassembled, plug the AC line cord directly into the power outlet. With the unit's AC switch first in the ON position and then OFF, measure the current between a known earth ground (metal water pipe, conduit, etc.) and all exposed metal parts, including: antennas, handle brackets, metal cabinets, screwheads and control shafts. The current measured should not exceed 0.5 milliamp. Reverse the power-plug prongs in the AC outlet and repeat the test.

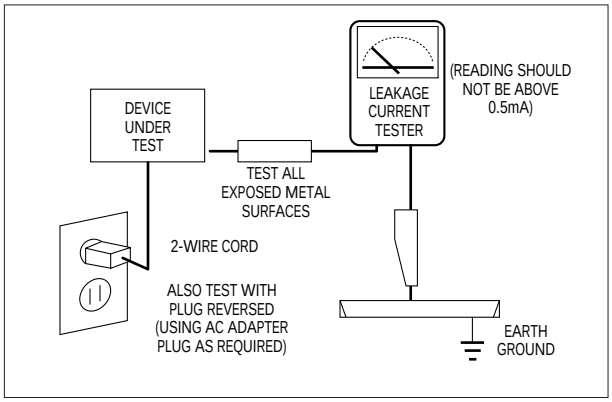

DEVICE UNDER TEST
LEAKAGE CURRENT TESTER
(READING SHOULD NOT BE ABOVE 0.5mA)
TEST ALL EXPOSED METAL SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1-1 AC Leakage Test

6. Antenna Cold Check:
   With the unit's AC plug disconnected from the AC source, connect an electrical jumper across the two AC prongs. Connect one lead of the ohmmeter to an AC prong. Connect the other lead to the coaxial connector.

7. X-ray Limits:
   The picture tube is especially designed to prohibit X-ray emissions. To ensure continued X-ray protection, replace the picture tube only with one that is the same type as the original. Carefully reinstall the picture tube shields and mounting hardware; these also provide X-ray protection.

8. High Voltage Limits:
   High voltage must be measured each time servicing is done on the B+, horizontal deflection or high voltage circuits. Correct operation of the X-ray protection circuits must be reconfirmed whenever they are serviced. (X-ray protection circuits also may be called "horizontal disable" or "hold-down".)

   Heed the high voltage limits. These include the X–ray Protection Specifications Label, and the Product Safety and X-ray Warning Note on the service data schematic.

1-1 Safety Precautions (Continued)

9. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

10. Design Alteration Warning:
Never alter or add to the mechanical or electrical design of this unit. Example: Do not add auxiliary audio or video connectors. Such alterations might create a safety hazard. Also, any design changes or additions will void the manufacturer's warranty.

11. Hot Chassis Warning:
Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord. If an isolation transformer is not used, these units may be safely serviced only if the AC power plug is inserted so that the chassis is connected to the ground side of the AC source.

    To confirm that the AC power plug is inserted correctly, do the following: Using an AC voltmeter, measure the voltage between the chassis and a known earth ground. If the reading is greater than 1.0V, remove the AC power plug, reverse its polarity and reinsert. Re-measure the voltage between the chassis and ground.

12. Some TV chassis are designed to operate with 85 volts AC between chassis and ground, regardless of the AC plug polarity. These units can be safely serviced only if an isolation transformer inserted between the receiver and the power source.

13. Some TV chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.

14. Components, parts and wiring that appear to have overheated or that are otherwise damaged should be replaced with parts that meet the original specifications. Always determine the cause of damage or overheating, and correct any potential hazards.

15. Observe the original lead dress, especially near the following areas: Antenna wiring, sharp edges, and especially the AC and high voltage power supplies. Always inspect for pinched, out-of-place, or frayed wiring. Do not change the spacing between components and the printed circuit board. Check the AC power cord for damage. Make sure that leads and components do not touch thermally hot parts.

16. Picture Tube Implosion Warning:
The picture tube in this receiver employs "integral implosion" protection. To ensure continued implosion protection, make sure that the replacement picture tube is the same as the original.

17. Do not remove, install or handle the picture tube without first putting on shatterproof goggles equipped with side shields. Never handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; do not try to remove such "permanently attached" yokes from the picture tube.

18. Product Safety Notice:
Some electrical and mechanical parts have special safety-related characteristics which might not be obvious from visual inspection. These safety features and the protection they give might be lost if the replacement component differs from the original—even if the replacement is rated for higher voltage, wattage, etc.

    Components that are critical for safety are indicated in the circuit diagram by shading, (⚠) or (⚠).
    Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications.
    A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Servicing Precautions

Warning1: First read the "Safety Precautions" section of this manual. If some unforeseen circumstance creates a conflict between the servicing and safety precautions, always follow the safety precautions.
Warning2: An electrolytic capacitor installed with the wrong polarity might explode.

1. Servicing precautions are printed on the cabinet. Follow them.

2. Always unplug the unit's AC power cord from the AC power source before attempting to: (a) Remove or reinstall any component or assembly, (b) Disconnect an electrical plug or connector, (c) Connect a test component in parallel with an electrolytic capacitor.

3. Some components are raised above the printed circuit board for safety. An insulation tube or tape is sometimes used. The internal wiring is sometimes clamped to prevent contact with thermally hot components. Reinstall all such elements to their original position.

4. After servicing, always check that the screws, components and wiring have been correctly reinstalled. Make sure that the portion around the serviced part has not been damaged.

5. Check the insulation between the blades of the AC plug and accessible conductive parts (examples: metal panels, input terminals and earphone jacks).

6. Insulation Checking Procedure: Disconnect the power cord from the AC source and turn the power switch ON. Connect an insulation resistance meter (500V) to the blades of the AC plug.

   The insulation resistance between each blade of the AC plug and accessible conductive parts (see above) should be greater than 1 megohm.

7. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

8. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

1-3 Precautions for Electrostatically Sensitive Devices (ESDs)

1. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs); examples include integrated circuits and some field-effect transistors. The following techniques will reduce the occurrence of component damage caused by static electricity.

2. Immediately before handling any semicon ductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground. Alternatively, wear a discharging wrist-strap device. (Be sure to remove it prior to applying power—this is an electric shock precaution.)

3. After removing an ESD-equipped assembly, place it on a conductive surface such as aluminum foil to prevent accumulation of electrostatic charge.

4. Do not use freon-propelled chemicals. These can generate electrical charges that damage ESDs.

5. Use only a grounded-tip soldering iron when soldering or unsoldering ESDs.

6. Use only an anti-static solder removal device. Many solder removal devices are not rated as “anti-static”; these can accumulate sufficient electrical charge to damage ESDs.

7. Do not remove a replacement ESD from its protective package until you are ready to install it. Most replacement ESDs are packaged with leads that are electrically shorted together by conductive foam, aluminum foil or other conductive materials.

8. Immediately before removing the protective material from the leads of a replacement ESD, touch the protective material to the chassis or circuit assembly into which the device will be installed.

9. Minimize body motions when handling unpackaged replacement ESDs. Motions such as brushing clothes together, or lifting a foot from a carpeted floor can generate enough static electricity to damage an ESD.

2. Specifications and IC Data

2-1 Specifications

Television System:

MODEL	SYSTEM
CI	PAL-I (UHF)
CII	PAL-I (VHF/UHF)
CX	PAL-B/G, SECAM-B/G
CK	PAL-B/G, D/K, SECAM-B/G, D/K
CW	PAL-B/G, D/K, SECAM-B/G, D/K, NT 4.43
CS	PAL-B/G, D/K, SECAM-B/G, D/K, NT4.43, NT3.58

Channels:

System / Band	PAL/SECAM-B/G,I	PAL, SECAM- D/K	SECAM-K1, PAL-D	NTSC - M
VHF	2 - 12	1 - 13	2 - 9	2 - 13
UHF	21 - 69	21 - 69	13 - 57	14-69

Intermediate Frequencies (MHz) :

SYSTEM / IF Carrier Frequency	PAL/ SECAM- B/G	PAL/SECAM-D/K, SECAM-K1	PAL - I	NTSC - M
Picture IF Carrier	38.90	38.90	38.90	38.90
Sound IF Carrier	33.40	32.40	32.90	34.40
Color Sub Carrier	34.47	34.47	34.47	35.32

Picture Tube:

14 Inch	A34KQV42X	Quick start, in-line-gun,
20 Inch	A48KRD82X(H)	Black stripe, 90°degree deflection
21 Inch	A51KQJ63X	

Power Requirements: AC 100~260V, 50/60Hz

Antenna Input Impedance: VHF, UHF : Telescopic dipole antenna (75 ohm unbalanced type)

Speaker Impedance
8 ohm, 5W+5W (Dual Type)
16 ohm, 3W (Monitor Type & Dual Type)

2-2 IC Line Up

Table 2-1 IC Line-Up

Loc. No	Specification	Description	Remark
HC101	PAP103	IF PRE-AMP	
IC201	TDA8842 TDA8841	PAL/SECAM-B/G, D/K, NTSC PAL-B/G, D/K, NTSC	Philips
IC301	TDA8356	VERTICAL OUTPUT	
IC501	TDA6107Q	RGB DRIVE AMP	
IC601	TDA7056B	SOUND-AMP (3W x 1CH or 3W x 2CH)	
IC602	TDA7057AQ	SOUND-AMP (5W x 2CH)	Dual Type
IC801	KA3S0680RF	POWER IC (STR)	
IC802	KA7630	CUSTOM REGULATOR (5V, 8V)	
IC901	SZM173EA	W/O TTX, English/French/Arabian	Zilog (Non TTX)
	SZM173AR	W/O TTX, English/Arabian	
	SZM173EV	W/O TTX, English/Vietnamese/Indonesian/Malay	
	SZM173EC	W/O TTX, English/Chinese	
	SZM173ET	W/O TTX, English/Thai	
	SZM173EW	W/O TTX, English/German/French/Dutch/Italian/Spanish, Swedish/Yugo/Greek/Croatian	
	SZM173EE	W/O TTX,English/Romanian/Hungarian/Polish/Czech/Bulgarian	
	SZM173ER	W/O TTX, English/Russian	
	SPM175EE	TTX, West : English/German/French/Dutch/Italian/Spanish/Swedish East : English/Czech/Croatian/Romanian/Hungarian/Polish	
	SPM175E	TTX, English/French/Swiss	
	SPM175ER	TTX, English/Russian/Bulgarian	
	SPM175EP	TTX, English/Iranian	Philips (TTX)
	SPM175EA	TTX, English/French/Arabian	
	SPM175EG	TTX, English/Greek/Yugo	
IC902	24C04/KS24C040	EEPROM	
PC801	TCET1108 / LTV817B	PHOTO COUPLER	

2-3 Semiconductor Base Diagrams

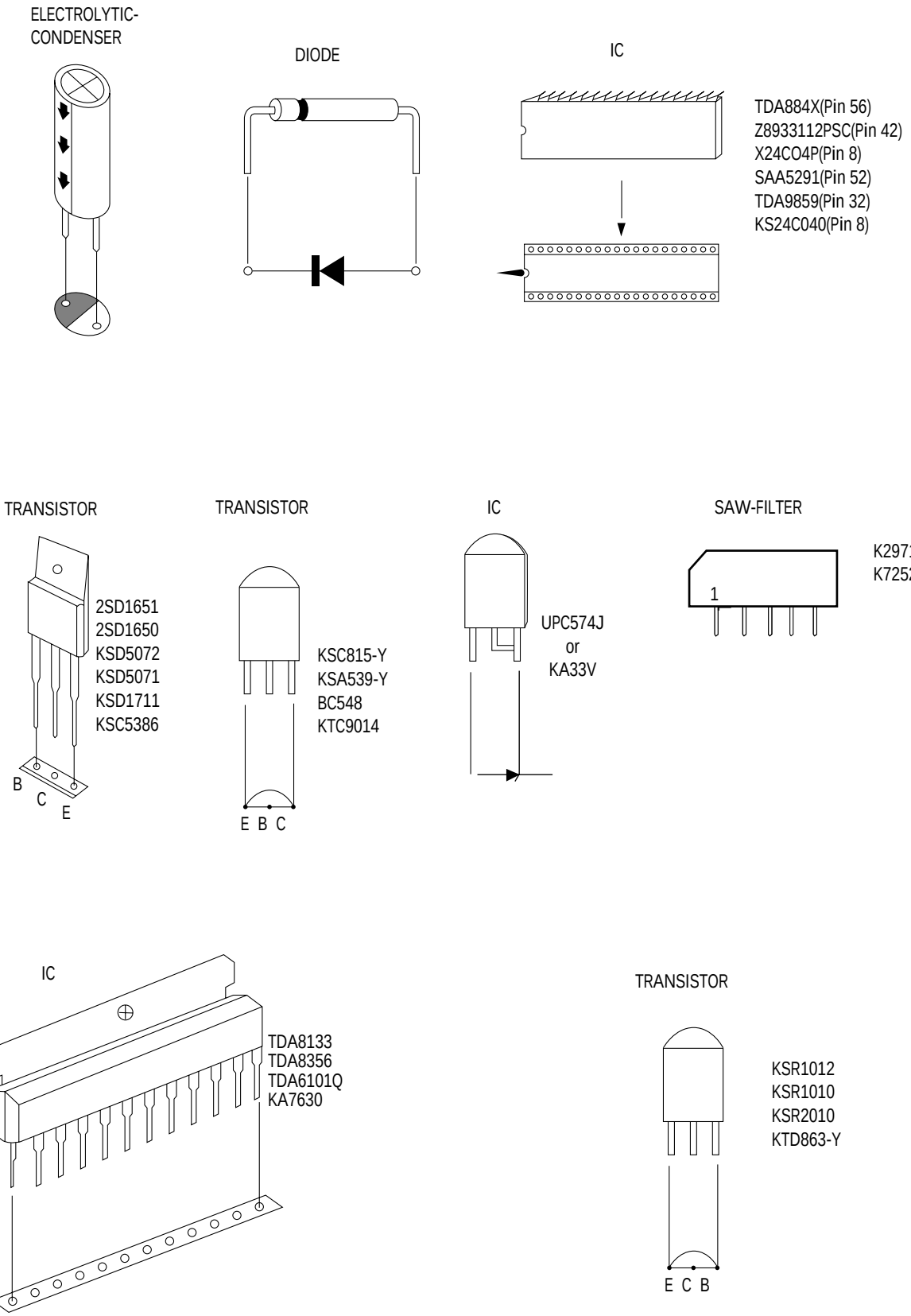
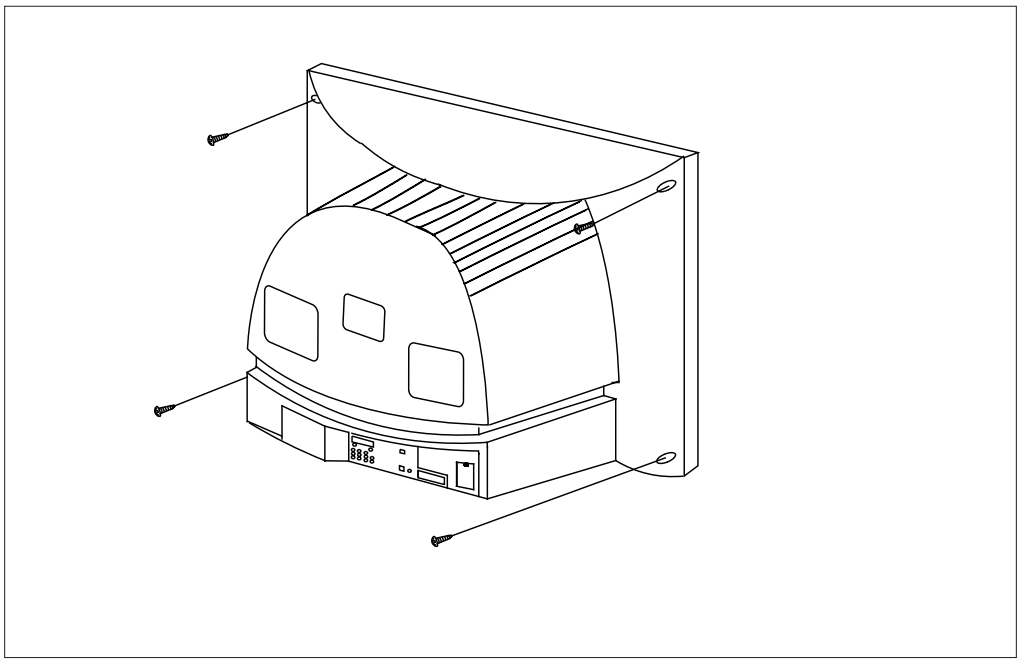


Fig. 2-1 Semiconductor Base Diagrams

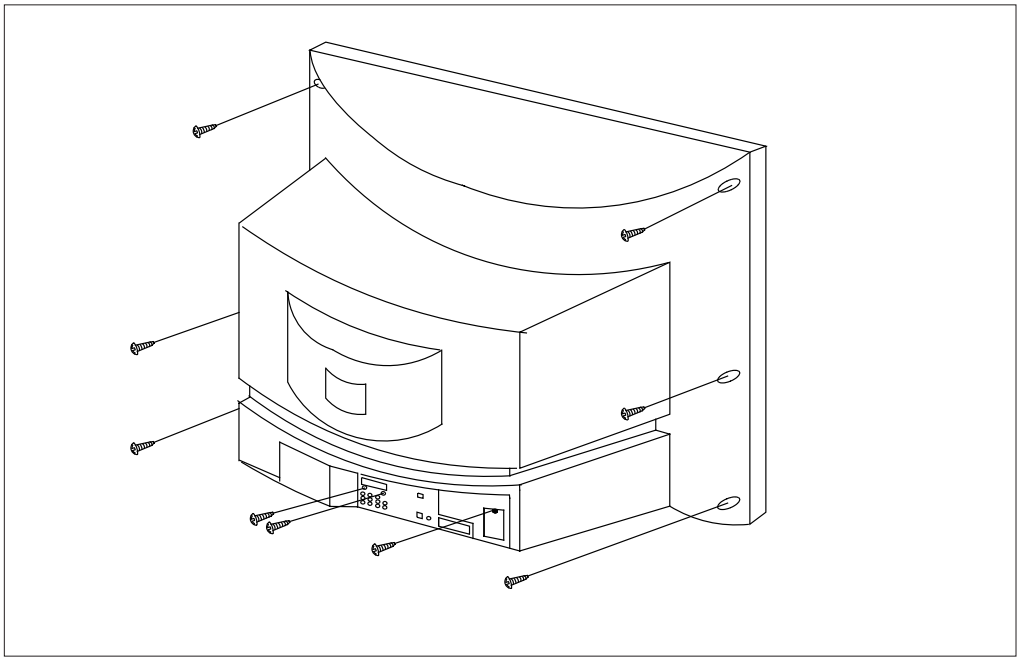
MEMO

3. Disassembly and Reassembly

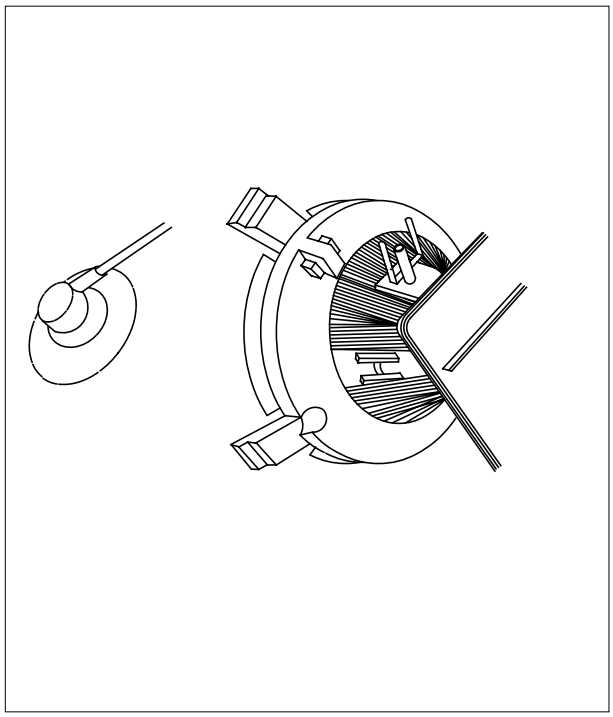
3-1 Back Cover Removal

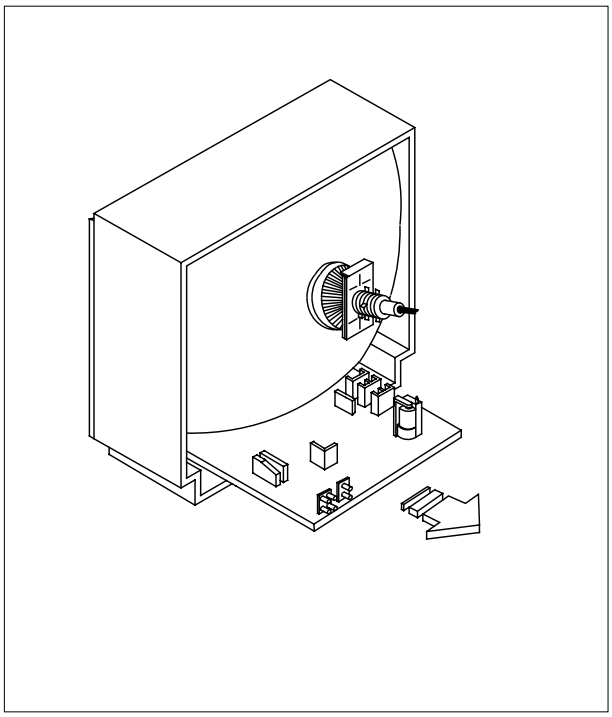


1. After removing the screws, press the tension rib and pull the cabinet backwards.
2. To reassemble, press the tension rib (see diagram).



3-2 Main Board Removal

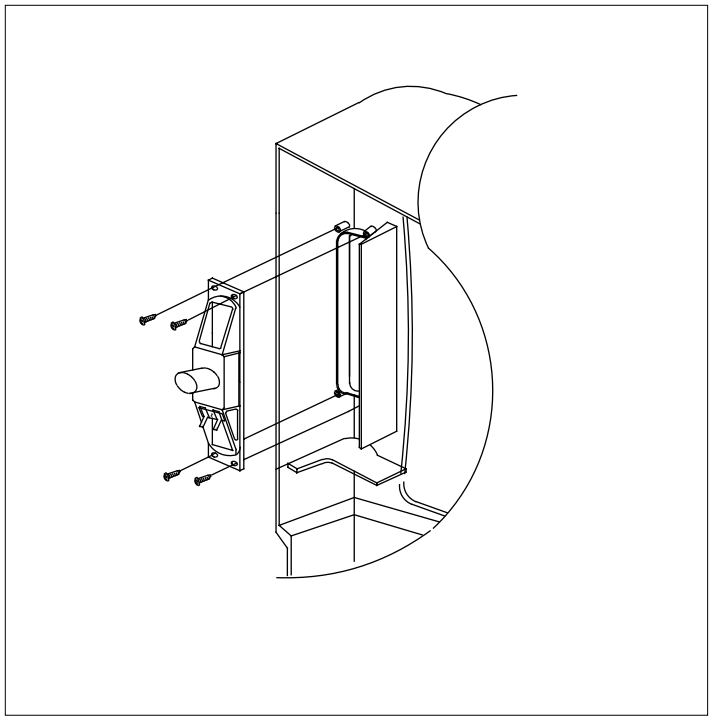




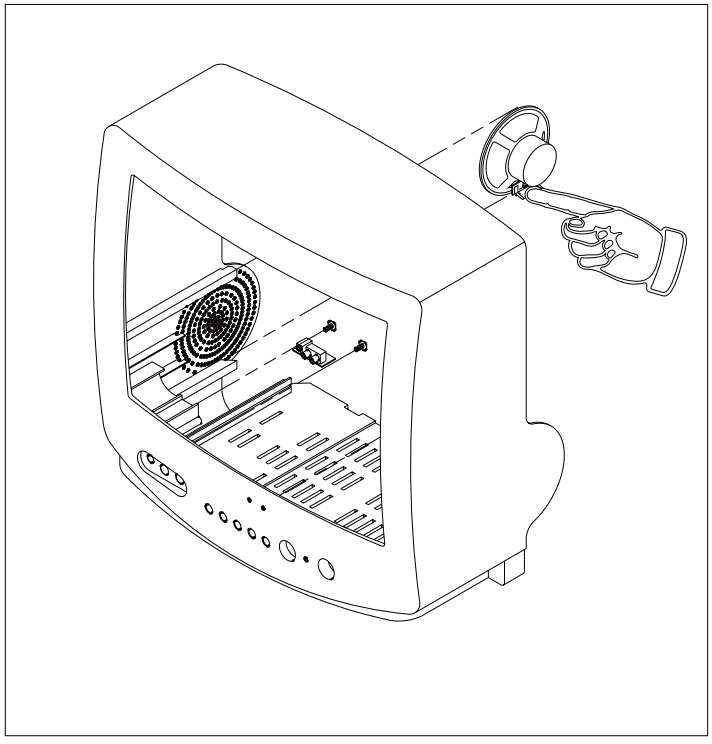
1. Separate the socket board from the CRT neck.
2. Remove the Anode Cap from the CRT.
3. Remove the main board by pulling it with both hands.

Warning: The FBT is charged with high voltage.
Before removing the Anode Cap, discharge the voltage through one of the heat sinks on the main board.

3-3 Speaker Removal

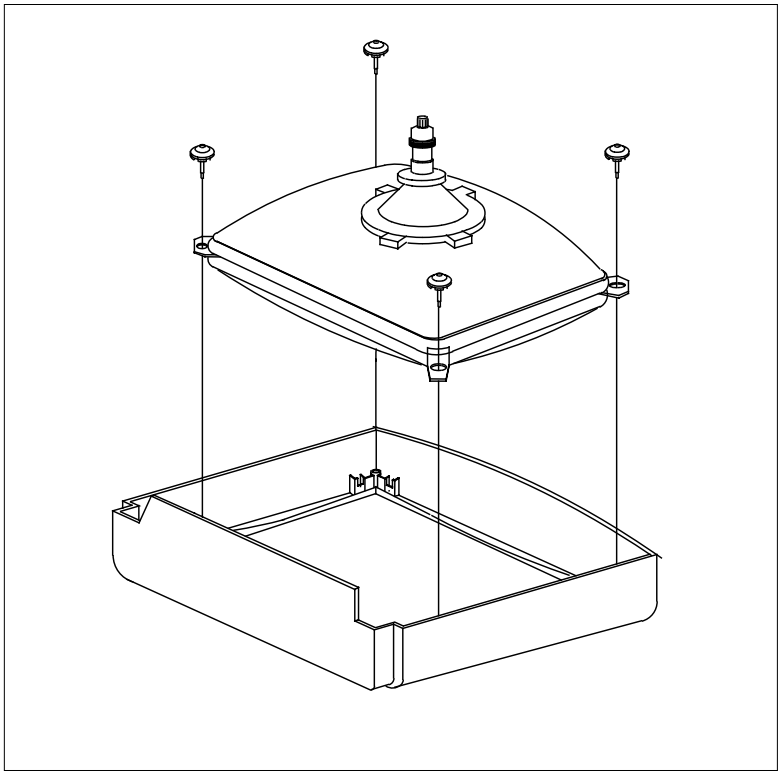


1. Remove the speaker by pressing the tension rib.



1. Remove the screws.
2. Remove the speaker by pressing the tension rib.

3-4 CRT Removal



1. Spread a soft mat on the floor. Place the TV set face down.

2. Remove the 4 nuts mounting the CRT to the front cabinet. Lift the CRT.

3. Caution: Because of the high vacuum and large surface area of the picture tube, be careful while handling it: (1) Always lift the picture tube by grasping it firmly around the faceplate, (2) Never lift the tube by its neck. (3) Do not scratch the picture tube or apply excessive pressure. Fractures of the glass may cause an implosion.

4. Alignment and Adjustments

4-1 Preadjustment

4-1-1 Factory Mode

1. Do not attempt these adjustments in the Video Mode.

2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.

3. Do not tamper with the “Adjustment” screen of the Factory Mode menu. This screen is intended only for factory use.

4-1-2 When EEPROM (IC902) Is Replaced

1. When IC902 is replaced all adjustment data revert to initial values. It is necessary to re-program this data.

2. After IC902 is replaced, warm up the TV for 10 seconds.

4-1-3 When CRT Is Replaced

1. Make the following adjustments AFTER setting up after setting up purity and convergence :

   White Balance
   Sub-Brightness
   Vertical Center
   Vertical Size
   Horizontal Size
   Fail Safe (This adjustment must be the last step).

2. If the EEPROM or CRT is replaced, set PVA to 45 (factory mode) and set SC as follows.

   14, 16 inch : 0
   20 inch : 10
   21 inch : 12

4-2 Factory/Service Mode

4-2-1 Procedure for the “Adjustment” Mode

1. This mode uses the standard remote control. The Service Mode is activated by entering the following remote-control sequence :

   (1) SLEEP→FACTORY.

   (2) STAND-BY→ DISPLAY→ P.STD→ MUTE →POWER ON.

2. The “SERVICE (FACTORY)” message will be displayed. The Service Mode has four components: Adjustment, Test Pattern, Option Bytes and Reset.

3. Access the Adjustment Mode by pressing the “VOLUME” keys (Up or Down). The adjustment parameters are listed in the accompanying table, and selected by pressing the CHANNEL keys (▲ ,▼).

4. Selection sequences for the all system:

   DOWN or UP key:
   AGC>VCO>SBT>SCT>SCR>SC>RG>GG>
   BG>CDL>BLU>PSL>PVS>PVA>PHS>NSR>
   STT

5. The VOLUME keys increase or decrease the adjustment values (stored in the non-volatile memory) when Adjustment Mode is cancelled.

6. Cancel the Adjustment Mode by re-pressing the “FACTORY” or “Power OFF” keys.

4-2-2 Main Adjustment Parameter

Table 4-1 Main Adjustment Parameter (Zilog, Phlips μ-com)				
FUNCTION	OSD ABBREVIATION	RANGE	INITIAL DATA	REMARK
AUTO GAIN CONTROL	AGC	0 ~ 63 STEP	10	TDA8842 TDA8841
VOLTAGE CONTROL OSCILLATOR	VCO	0 ~ 128 STEP	80	
		0 ~ 1 STEP	1 (For East Europe)	
SUB BRIGHT	SBT	0 ~ 23 STEP	8	
SUB CONTRAST	SCT	0 ~ 23 STEP	10	
SUB COLOR	SCR	0 ~ 23 STEP	10	
S-CORRECTION	SC	0 ~ 63 STEP	12	
RED DRIVE GAIN	RG	0 ~ 63 STEP	47	
GREEN DRIVE GAIN	GG	0 ~ 63 STEP	32	
BLUE DRIVE GAIN	BG	0 ~ 63 STEP	34	
CATHODE DRIVE LEVEL	CDL	0 ~ 7 STEP	4	
BLUE STRETCH MODE	BLU	0 ~ 3 STEP	0	
PAL VERTICAL SLOPE	PSL	0 ~ 63 STEP	32	
PAL VERTICAL SHIFT	PVS	0 ~ 63 STEP	32	
PAL VERTICAL AMPLITUDE	PVA	0 ~ 63 STEP	42	
PAL HORIZONTAL SHIFT	PHS	0 ~ 63 STEP	40	
NTSC SUB COLOR	NSR	0 ~ 23 STEP	7	
SUB TINT	STT	1 ~ 13 STEP	0	
TTX SUB-CONTRAST	TSS	0 ~ 63 STEP	16 (Only TTX Model)	

NOTE : PVS,PVA, PHS, parameters must be aligned using the 50Hz vertical-field rates.

4-2-3 Test Pattern (Aging Mode)

1. This mode can be used during servicing, or for confirming that the convergence and purity adjustments are correct.

2. Access the Test Pattern parameters by pressing a CHANNEL keys (▲ ,▼) while the Service Mode is on. The cursor will move to the test pattern. Press the VOLUME keys. On-screen display:

   • WHITE —— NON -TTX MICOM ONLY

   • AGING —— TTX MICOM

3. AGING Mode (Reference Only)

   This pattern is used for pre-heating the CRT during manufacturing —it is accessed in the factory by twice pressing the "SLEEP → FACTORY→FACTORY " key, then white pattern will be displayed.

   Even if the TV power is cut off, the Aging Mode is not cancelled, The aging mode is cancelled by repressing the "FACTORY" key or pressing the local "CH UP/DOWN" keys.

4-2-4 Option Bytes

In the Service Mode, various can be selected via the Option Bytes (8 bits each). Example:

SYSTEM OSD DISPLAY	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
BYTE 0 : 8 -			L (BIT : 0)	H (BIT : 8)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)
BYTE 1 : 0 -	L (BIT :0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)	L (BIT : 0)

TDA8842, CK SYSTEM, RCA JACK SYSTEM OSD DISPLAY

BYTE 0 : 11	L (BIT : 1)	H (BIT : 0)	L (BIT : 0)	H (BIT : 0)	L (BIT : 1)	

4-2-4 (A) NON-TTX MICOM (SZM-173EC) OPTION BYTE (FOR CHINA/SINGAPORE/GERMAN ARMY)

	Destination	BYTE 0	BYTE 1
MP (Massproduction) OPTION BYTE	China	15	D8
	Singapore	57	58
	German Army	57	18

BYTE	BIT	LOW (0)	HIGH (1)	Application MICOM
BYTE 0	D7	NOT USED		MUST LOW
	D6	TV : NORMAL → ZOOM A/V :NORMAL → ZOOM	TV: NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	MUST = LOW : China (only) 16 : 9 (Delete)
	D5	NOT USED		MUST = LOW
	D4	CH Up/down functional in the A/V Mode (SCART Jack)	CH Up/down not functional in the A/V Mode (RCA Jack)	MUST = HIGH
	D3	Sound-I System Used	Sound-I System Not Used	
	D2 / D1	(see inner table)		
	D0	TDA8374A	TDA8842	IC201 (ONE-CHIP) OPTION
BYTE 1	D7	TV OUT	MONITOR OUT	HIGH (For China)
	D6	English ONLY	English/Chinese	MUST = HIGH
	D5	AFT ON (always)	AFT OFF (after fine tuning)	BASIC = LOW
	D4	Existing Sharpness level (when using the TDA6108 RGB AMP)	Sharpness level up (when using the TDA6107Q RGB AMP)	BASIC = HIGH
	D3	No Auto Power On	Auto Power On	BASIC = HIGH
	D2	NTSC : 25KHz (NTSC TABLE) PAL : 50KHz (PAL TABLE)	NTSC : 25KHz (NTSC TABLE) PAL : 27KHz (NTSC TABLE)	
	D1 / D0	NOT USED (D1 D0 = MUST 00)		

D2	D1	COLOR SYSTEM	SOUND SYSTEM	Remark
0	0	● CK : AUTO (NO OSD)	"?" →B/G →D/K	China MP : CD German Army : CS
0	1	● CW : ■ RF : AUTO → PAL → SECAM → NT4.43 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58	"?" →B/G →D/K→ I	
1	0	● CD : ■ RF : AUTO → PAL → NT4.43 ■ A/V : AUTO → PAL → NT4.43 → NT3.58	"?" →D/K ↔ I	
1	1	● CS : ■ RF: AUTO →PAL →SECAM →NT4.43 →NT3.58 ■ A/V: AUTO →PAL →SECAM→NT4.43→NT3.58	"?" → B/G→D/K→ (I) → NT- M	D3 BIT OPTION

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal
2. AUDIO MUTE during no signal
3. BLUE SCREEN ON/OFF
4. TIMER CLOCK ON/OFF
5. No CHILD LOCK

4-2-4 (B) NON-TTX MICOM (SZM-173EW/EE) OPTION BYTE (FOR EUROPE)

	Destination	BYTE 0	BYTE 1
MP OPTION BYTE	United Kingdom	C3	98
	France/Swiss	41	9E
	Western Europe (except UK)	45	98
	Eastern Europe	41	58

BYTE	BIT	LOW(0)	HIGH(1)	Remark
BYTE 0	D7	3 BAND	UHF ONLY	HIGH (UK only)
	D6	TV : NORMAL → ZOOM A/ : NORMAL → ZOOM	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	MUST = HIGH
	D5	MUST LOW		POLAND OPTION - R913 : 680Ω added - J901 :
	D4	CH Up/down functional in the A/V Mode (SCART Jack)	CH Up/down not functional in the A/V Mode (RCA Jack)	MUST = LOW
	D3	NOT USED		MUST = LOW
	D2, D1	(see table below)		
	D0	TDA8374A	TDA8842	IC201 (ONE-CHIP) OPTION

D2	D1	SOUND SYSTEM	COLOR SYSTEM	Destination
0	0	(?) → B/G ↔ D/K : CK MODEL	AUTO : NO OSD	Eastern Europe/France/Swiss
0	1	I ONLY (NO OSD) : CI,CII MDL		United Kingdom
1	0	B/G ONLY (NO OSD) : CB,CX MDL		Western Europe
1	1	NOT USED		

BYTE	BIT	LOW(0)	HIGH(1)	Remark
BYTE 1	D7		English/German/Dutch/Italian/Spnish/ Swedish/Croatian/Yugo/Greek	Western Europe (SZM-173EW)
	D6		English/Romanian/Hungarian/Polish/ Czech/Bulgarian	Eastern Europe (SZM-173EE)
	D5	AFT ON (always)	AFT OFF (after fine tuning)	MUST = LOW
	D4	Existing sharpness level : TDA6108	Sharpness level up : TDA6107Q	MUST = HIGH
	D3	No Auto Power On	Auto Power On	MUST = HIGH
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)	NTSC : 25KHz(NTSC TABLE) PAL : 27KHz(NTSC TABLE)	- France/ Swiss : HIGH - Others : LOW
	D1	PAL / SECAM	SECAM - L	- France/Swiss (only) : HIGH - SZM-173EW (only)
	D0	MUST : LOW		

● P-STD Classification (CON./BRI./SHAR./COL)

STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
90/50/50/50	100/50/75/50	90/50/75/50	60/50/50/50	90/50/50/50

● Function Required: 1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE during no signal.
3. No BLUE SCREEN during no RF signal (Blue Screen during AV).
4. No TIMER. 5. No CHILD LOCK. 6. See "Detailed functions of CF".

4-2-4 C) NON-TTX MICOM (SZM-173ER) OPTION BYTE (FOR RUSSIA)

Destination	BYTE 0	BYTE 1
Russia,CIS	49	58
Australia	5D	18

<table>
<tr><th>BYTE</th><th>BIT</th><th>LOW(0)</th><th>HIGH(1)</th><th>Remark</th></tr>
<tr><td rowspan="8">BYTE 0</td><td>D7</td><td></td><td></td><td>MUST = LOW</td></tr>
<tr><td>D6</td><td>TV : NORMAL → ZOOM
A/V : NORMAL → ZOOM</td><td>TV : NORMAL → ZOOM → 16:9
A/V : NORMAL → ZOOM</td><td>MUST = HIGH</td></tr>
<tr><td>D5</td><td></td><td></td><td>MUST = LOW</td></tr>
<tr><td>D4</td><td>CH Up/down functional in the A/V Mode (SCART Jack)</td><td>CH Up/down not functional in the A/V Model (RCA Jack)</td><td></td></tr>
<tr><td>D3</td><td>PAL-I Used</td><td>PAL-I Not Used</td><td>MUST = HIGH</td></tr>
<tr><td>D2
D1</td><td colspan="2"><table>
<tr><th>D2</th><th>D1</th><th>SOUND SYSTEM</th><th>COLOR SYSTEM</th></tr>
<tr><td>0</td><td>0</td><td>(?) → B/G ↔ D/K : CK MODEL</td><td>AUTO : NO OSD</td></tr>
<tr><td>0</td><td>1</td><td>I ONLY (NO OSD) : CI,CII MDL</td><td></td></tr>
<tr><td>1</td><td>0</td><td>B/G ONLY (NO OSD) : CB,CX MDL</td><td></td></tr>
<tr><td>1</td><td>1</td><td>NOT USED</td><td></td></tr>
</table></td><td></td></tr>
<tr><td>D0</td><td>TDA8374A</td><td>TDA8842</td><td>IC201 (ONE-CHIP) OPTION</td></tr>
<tr><td rowspan="8">BYTE 1</td><td>D7</td><td></td><td></td><td>MUST = LOW</td></tr>
<tr><td>D6</td><td>English</td><td>English/Russian</td><td></td></tr>
<tr><td>D5</td><td>AFT ON (always)</td><td>AFT OFF (after fine tuning)</td><td>MUST = LOW</td></tr>
<tr><td>D4</td><td>Existing sharpness level (when using the TDA6108 RG AMP)</td><td>Sharpness level up (when using the TDA6107Q AMP)</td><td>MUST = HIGH</td></tr>
<tr><td>D3</td><td>No Auto Power On</td><td>Auto Power On</td><td>BASIC = HIGH</td></tr>
<tr><td>D2</td><td>NTSC: 25 KHz (NTSC TABLE)
PAL : 50 KHz (PAL TABLE)</td><td>NTSC : 25 KHz (NTSC TABLE)
PAL : 27 KHz (NTSC TABLE)</td><td></td></tr>
<tr><td>D1</td><td colspan="2" rowspan="2">NOT USED (MUST = LOW)</td><td rowspan="2"></td></tr>
<tr><td>D0</td></tr>
</table>

● P-STD Classification (CON/BRI/SHAR/COL)

STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
90/50/50/50	100/50/75/50	90/50/75/50	60/50/50/50	90/50/50/50

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal
2. AUDIO MUTE during no signal
3. BLUE SCREEN available
4. TIMER available
5. No CHILD LOCK

4-2-4 (D) NON-TTX MICOM (SZM-173AR/EA) OPTION BYTE (FOR MIDDLE RAST/AFRICA)

	Destination	BYTE 0	BYTE 1
MP OPTION BYTE	Middle East (EA or AR)	7F	58
	Africa (EA)	67	D8

BYTE	BIT	LOW (0)	HIGH (1)	Remark
BYTE 0	D7			MUST = LOW
	D6	TV : NORMAL → ZOOM A/V : NORMAL → ZOOM	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	MUST = HIGH
	D5	NOT USED	CHILD LOCK ON	MUST = HIGH
	D4	CH Up/down functional in the A/V Mode (SCART Jack)	CH Up/down not functional in the A/V Model (RCA Jack)	Middle East : HIGH Africa : LOW
	D3	Sound-I System Used	Sound-I System Not Used	Middle East : HIGH Africa : LOW
	D2 / D1	(see table below)		
	D0	TDA8374A	TDA8842	IC201 (ONE-CHIP) OPTION

D2	D1	COLOR SYSTEM	SOUND SYSTEM
0	0	● CK : AUTO (NO OSD)	"?" → B/G → D/K
0	1	● CW : -. RF : AUTO → PAL → SECAM → NT4.43 -. A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58	"?" → B/G → D/K → I
1	0	● CB : - RF : PAL ONLY - A/V : AUTO → PAL → NT4.43 → NT3.58	B/G ONLY (NO OSD)
1	1	● CS : -. RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 -. A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58	"?" → B/G → D/K → I → NT- M →

BYTE	BIT			
BYTE 1	D7 / D6	(see table below)		
	D5	AFT ON (always)	AFT OFF after fine tuning	MUST = LOW
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)	Sharpness level up (when using the TDA6107Q RGB AMP)	MUST = HIGH
	D3	No Auto Power On	Auto Power On	MUST = HIGH
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)	NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)	
	D1 / D0	MUST : DO D1 = 00		

D7	D6	LANGUAGE	Remark
0	0	-	NOT USED
0	1	ENG / ARAB	Middle East
1	0	-	NOT USED
1	1	ENG / ARAB / FRENCH	EA VERSION (Africa ONLY)

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal
2. AUDIO MUTE during no signal.
3. BLUE SCREEN ON/OFF
4. TIMER (CLOCK ON/OFF)
5. CHILD LOCK ON (always)

4-2-4 (E) NON-TTX MICOM (SZM-173EV/ET) OPTION BYTE (FOR ASIA)

	Destination	BYTE 0	BYTE 1
OPTION BYTE	Vietnam/Malaysia (NO LINE STEREO)	5F	58
	Vietnam (LINE STEREO MODEL)	DF	D8
	Thailand	5D	58
	Indonesia	5D	5A
	India	5D	18

BYTE	BIT	LOW (0)	HIGH (1)	Remark
BYTE 0	D7	LINE STEREO OFF	LINE STEREO ON	SZM-173EV (only)
	D6	TV : NORMAL → ZOOM A/V : NORMAL → ZOOM	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	MUST = HIGH
	D5			MUST = LOW
	D4	CH Up/down functional in the A/V Mode (SCART Jack)	CH Up/down not functional in the A/V Mode (RCA Jack)	BASIC = HIGH
	D3	Sound-I System Used	Sound-I System Not Used	MUST = HIGH
	D2 D1	(see table below)		
	D0	TDA8374A	TDA8842	IC201 (ONE-CHIP) OPTION
BYTE 1	D7	TV OUT	MONITOR OUT	
	D6	English ONLY	English/Vietnamese/Indonesian/Malay	SZM-173EV
			English/Thai	SZM-173ET
	D5	AFT ON (always)	AFT OFF (after fine tuning)	
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)	Sharpness level up (when using the TDA6107Q RGB AMP)	MUST = HIGH
	D3	No Auto Power On	Auto Power On	BASIC = HIGH
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)	NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)	MUST = LOW
	D1	CLOCK DISPLAY OFF	CLOCK DISPLAY ON	Indonesia ONLY : HIGH
	D0	MUST = LOW		

D2	D1	COLOR SYSTEM	SOUND SYSTEM	Destination
0	0	● CK :AUTO (NO OSD)	"?" → B/G → D/K	
0	1	● CW : -. RF : AUTO → PAL → SECAM → NT4.43 -. A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58	"?" → B/G → D/K → I	
1	0	● CB : - RF : PAL ONLY - A/V : AUTO → PAL → NT4.43 → NT3.58	B/G ONLY (NO OSD)	Indonesia/Thailand/ India
1	1	● CS: - RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 -A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58	"?" → B/G → D/K → I NT- M →	Vietnam Malaysia

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE during no signal.
3. BLUE SCREEN ON/OFF. 4. TIMER (CLOCK ON/OFF). 5. No CHILD LOCK

SZM -173ET (16K) : Z90203 → WITHOUT LINE STEREO
SZM -173EV (24K) : Z90234 → WITH LINE STEREO

4-2-4 (F) TTX MICOM (SZM-175EA/EP) OPTION BYTE (FOR MIDDLE EAST ASIA)

MP OPTION BYTE	Destination	Application MICOM	BYTE0	BYTE1
	Iran (Persian TTX)	SPM-175EP	1F	18
	Middle East (except Iran)	SPM-175EA	1F	18
	Africa		07	18

BYTE	BIT	LOW (0)	HIGH (1)	Application MICOM
BYTE 0	D7	NOT USED		ALL = LOW
	D6	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM → 16:9	MUST = LOW
	D5	NOT USED		ALL = LOW
	D4	CH Up/down functional in the A/V Mode (SCART Jack)	CH Up/down not functional in the A/V Mode (RCA Jack)	– Africa : SCART – Others : RCA
	D3	Sound-I System Used	Sound-I System Not Used	SOUND-I : Africa (only)
	D2 / D1	D2 D1 = 0 0 : ● CK : AUTO (NO OSD) — "?" → B/G → D/K 0 1 : ● CW : ■ RF : AUTO → PAL → SECAM → NT4.43 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58 — "?" → B/G → D/K → I 1 0 : ● CB : ■ RF : PAL ONLY (NO OSD) ■ A/V : AUTO → PAL → NT4.43 → NT3.58 — B/G ONLY (NO OSD) 1 1 : ● CS : ■ RF : AUTO → PAL → SECAM → NT4.43 → NT3.58 ■ A/V : AUTO → PAL → SECAM → NT4.43 → NT3.58 — "?" → B/G → D/K → I → NT → M		Remark: No sound system in the A/V MODE
	D0	TDA8374A	TDA 8842	
BYTE 1	D7 / D6 / D5	NOT USED		ALL = LOW
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)	Sharpness level up (when using the TDA6107Q RGB AMP)	ALL (BASIC = HIGH) → TEST Unnecessary
	D3	No Auto Power On	Auto Power On	ALL (BASIC = HIGH)
	D2	NTSC : 25 KHz (NTSC TABLE) PAL : 50 KHz (PAL TABLE)	NTSC : 25 KHz (NTSC TABLE) PAL : 27 KHz (NTSC TABLE)	
	D1 / D0	D1 D0 = MUST 00		MUST = LOW

● OSD language by micom

1. Persian (for Iran) : SPM-175EP : English/Persian (Iranian)
2. Arab (Middle East, Africa) : SPM-175EA : English/French/Arabian

● Function Required : 1. PICTURE OFF (after 15 minutes) during no signal
2. AUDIO MUTE (during no signal)
3. No BLUE
4. No TIMER SCREEN
5. No CHILD LOCK

4-2-4 (G) TTX MICOM (SPM-175EE/ER/EG) OPTION BYTE (FOR EUROPE)

	Destination	Application MICOM	BYTE 0	BYTE 1	LANGUAGE
MP OPTION BYTE	United Kingdom	SPM-175EE	83	18	See BYTE 1 D5
	Other Western Europe		05	18	
	Eastern Europe		01	38	
	France/Swiss	SPM-175E	01	5C	
	Yugo/Greece	SPM-175EG	05	18	English/Yugo/Greek
	Russia/Bulgaria	SPM-175ER	01	18	English/Russian/Bulgarian

BYTE	BIT	LOW(0)	HIGH(1)	Remark
BYTE 0	D7	3 BAND	UHF DNLY (UK only)	
	D6	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM	TV : NORMAL → ZOOM → 16:9 A/V : NORMAL → ZOOM → 16:9	
	D5	MUST = LOW	<POLAND OPTION> R913 : 680W added. J901 : Delete	
	D4	CH Up/Down functional in the A/V Mode (SCART Jack)	CH Up/Down not functional in the A/V Model (RCA Jack)	MUST = LOW
	D3	P-STD NORMAL	P-STD MAX	MUST = LOW
	D2 / D1	D2 D1 SOUND SYSTEM: 0 0 (?) → B/G ↔ D/K : CK MODEL; 0 1 I ONLY (NO OSD) : CI,CII MODEL; 1 0 B/G ONLY (NO OSD): CB,CX MODEL; 1 1 NOT USED	COLOR SYSTEM: AUTO (NO OSD)	Remark: No SOUND SYSTEM in the A/V Mode
	D0	TDA8374A	TDA8842	ALL = LOW
BYTE 1	D7	NOT USED		
	D6	PAL/SECAM	SECAM - L	HIGH (CF only)
	D5	English/German/French/Dutch/ Italian/Spanish/Swedish	English/Croatian/Romanian/ Hungarian/Polish/Czech	This bit is only appied to SPM-175EE
	D4	Existing sharpness level (when using the TDA6108 RGB AMP)	Sharpness level up (when using the TDA6107Q AMP)	ALL BASIC = HIGH → TEST Unnecessary
	D3	No Auto Power On	Auto Power On	ALL BASIC = HIGH
	D2	NTSC : 25KHz (NTSC TABLE) PAL : 50KHz (PAL TABLE)	NTSC : 25KHz (NTSC TABLE) PAL : 27KHz (NTSC TABLE)	ALL (RF VOL. CURVE) BASIC :LOW
	D1	MUST = LOW		
	D0	MUST = LOW		

● P-STD Classification (CON/BRI/SHRP/COL)

D3 BIT	STANDARD MODE	DYNAMIC MODE	MOVIE MODE	MILD MODE	CUSTOM MODE
0	90/50/50/50	100/50/50/50	75/55/50/50	60/50/50/50	90/55/25/50

● Function Required :1. PICTURE OFF (after 15 minutes) during no signal. 2. AUDIO MUTE (during no signal).
3. No BLUE SCREEN. 4. No TIMER (CLOCK /OFF). 5. No CHILD LOCK

4-2-5 RESET

The Reset Mode is used during factory inspection.
Function Reset:

1.	Channels	Add/Erase
2.	Sort	Non
3.	System	Auto
4.	Timer	off
5.	Blue Screen	off
6.	Child Lock	off
7.	Picture	standard
8.	Volume	10
9.	CH. Skip	Erased

4-3 Other Adjustments

4-3-1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. The picture should have good black and white details. There should be no objectionable color shading; if color shading is present, perform the purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent.

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

4-3-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 30 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

4-3-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to +125 volts (Full color bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.
2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).
3. The high voltage should not exceed 27.5KV.
4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 27.5KV under any conditions.

4-3-4 FOCUS Adjustment

1. Input a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-3-5 Cathode Voltage Adjustment (Screen Adjustment)

1. Connect CRT socket pin GK to an oscilloscope probe.
2. Input a gray scale pattern. (Use a pattern generator, PM5518)
3. Use the P mode key (on the remote control) for the STANDARD picture.
4. Adjust the Screen VR (on the FBT) so that the voltage on the oscilloscope becomes 130±2.5V (See Fig. 4-1).

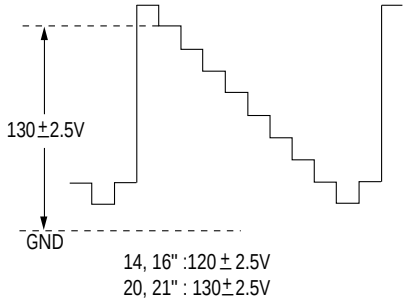


Fig. 4-1

4-3-6 Purity Adjustment

1. Warm up the receiver for at least 20 minutes.
2. Plug in the CRT deflection yoke and tighten the clamp screw.
3. Plug the convergence yoke into the CRT and set in as shown in Fig. 4-2.
4. Input a black and white signal.
5. Fully demagnetize the receiver by applying an external degaussing coil.
6. Turn the CONTRAST and BRIGHTNESS controls to maximum.
7. Loosen the clamp screw holding the yoke. Slide the yoke backward or forward to provide vertical green belt. (Fig. 4-3).
8. Tighten the convergence yoke.
9. Slowly move the deflection yoke forward, and adjust for the best overall green screen.
10. Temporarily tighten the deflection yoke.
11. Produce blue and red rasters by adjusting the low-light controls. Check for good purity in each field.
12. Tighten the deflection yoke.

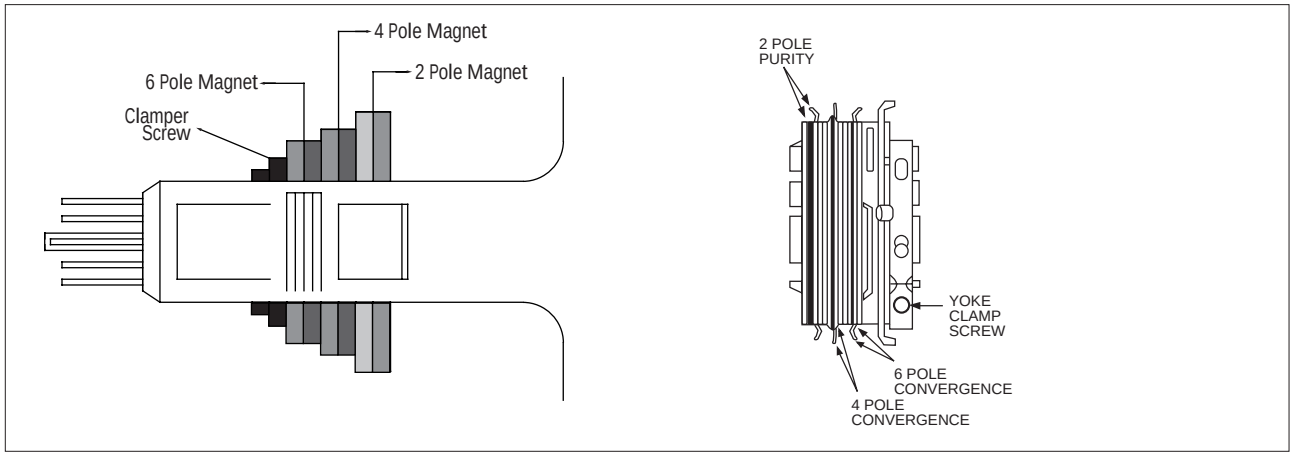


Fig. 4-2 Convergence Magnet Assembly

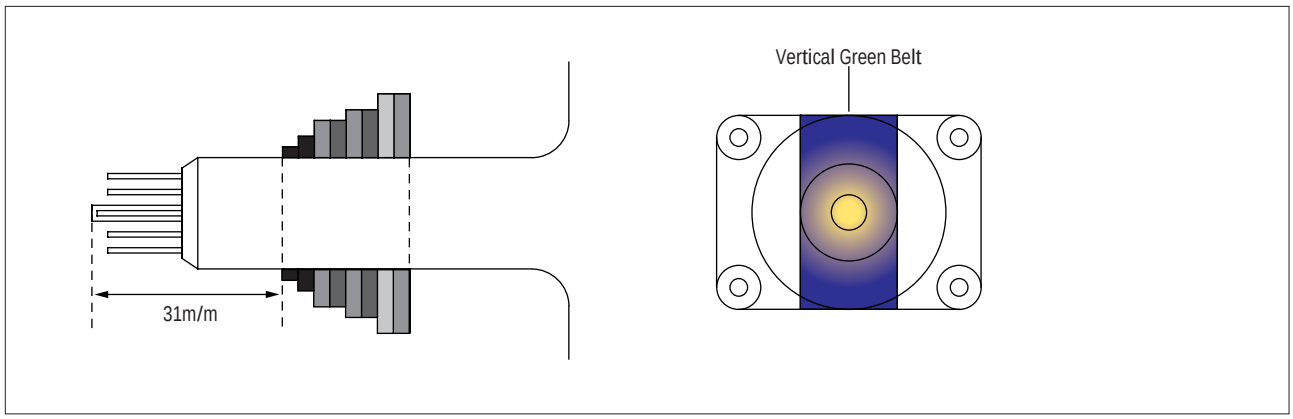


Fig. 4-3 Center Convergence Adjustment

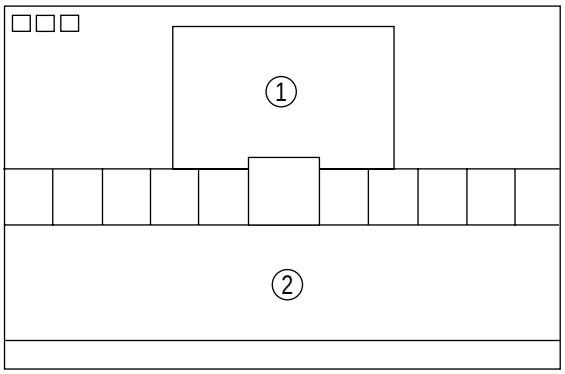


Fig. 4-4

4-3-7 White Balance Adjustment

(a) Set up

1. Warm up the TV for at least 30 minutes in the Aging Mode (OSD White). This mode is displayed by entering the following sequence:

   SLEEP →FACTORY → FACTORY

2. Input a Toshiba pattern.

(b) Low-Light Adjustment

1. Set SBT to 1.3 ± 0.2 fL in the Factory Service Mode with using CA100. See Fig. 4-4 ②.

2. Adjust RG,BG so that the levels are suitable to each local area.

(c) High-Light Adjustment

1. Set SCT to 55 FL (20". 21"), 65 FL(14".16") in the Factory Service Mode with using CA100. See Fig. 4-4 ①.

4-3-8 Center Convergence Adjustment

1. Warm up the receiver for at least 20 minutes.

2. Adjust the two tabs of the 4 pole magnets to change the angle between them. Superimpose the red and blue vertical lines in the center area of the screen.

3. Adjust the Brightness and Contrast controls for a well defined picture.

4. Adjust the two-tab pairs of the 4 pole magnets, and change the angle between them. Superimpose the red and the blue vertical lines in the center area of the screen.

5. Turn the both tabs at the same time, keeping the angle constant, and superimpose the red and blue horizontal line in the center of the screen.

6. Adjust the two-tab pairs of the 6-pole magnets to superimpose the red and blue line onto the green. (Changing the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.)

7. Repeat adjustments 2~6, if necessary.

8. Since the 4-pole magnets and 6-pole magnets interact, the dot movement is complex (Fig. 4-5).

Fig. 4-5 Center Convergence Adjustment

4-3-9 VCO Adjustment

Set the vco data to 80 (Factory Mode).
NOTE : For SZM-173EW and SPM-175E (Western Europe remote control), set the VCO data to 1.

4-3-10 RF AGC Adjustment

Set the AGC data to 14 (Factory Mode).

4-3-11 Sub-Color Adjustment

Set SCR data to 10 (Factory Mode).

4-3-12 Geometry Adjustment

SC →PVA→PVS→ PSL →PHS

1. Input a lion head pattern (in the PAL channel).
2. Set the SC (S-Correction) as follows : 12 (21”), 10 (20”), 0 (14”,16”) and PVA 40 so that the lion head circle becomes oval.
3. Adjust with PVS (Vertical shift) so that the top margin of the picture is 4.

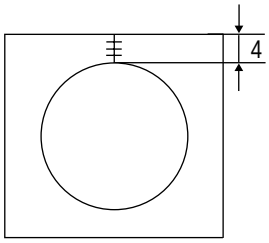


Fig. 4-7

4. Adjust with PSL (Vertical-Slope) so that the bottom margin of the picture is 4.

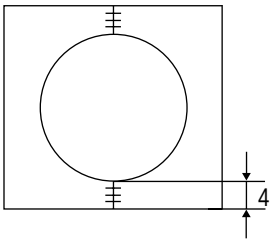


Fig. 4-8

5. Adjust with PHS (Horizontal Shift) so that the lion-head pattern and CRT centers are aligned.

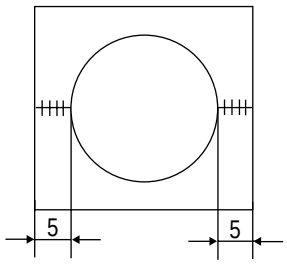


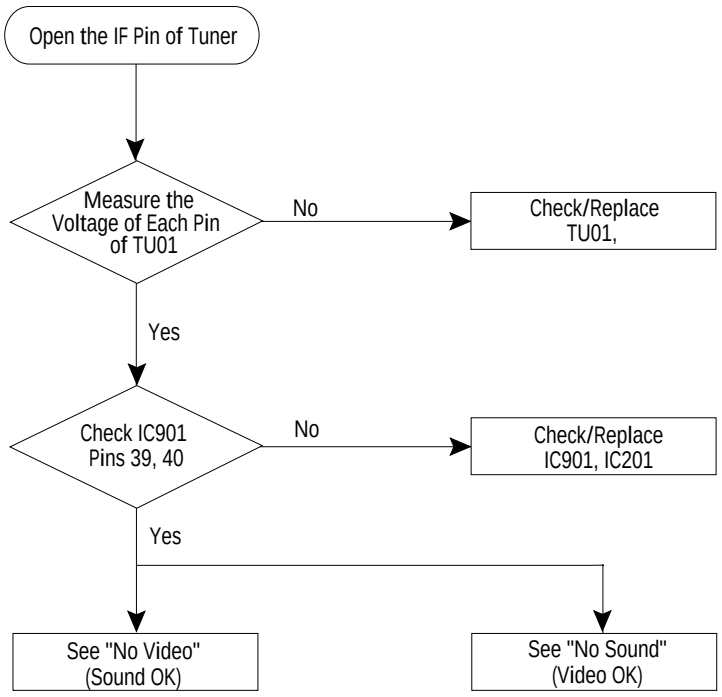
Fig. 4-9

6. Adjust PHS (using the width coil) so that the left and right margins of the picture are 5.

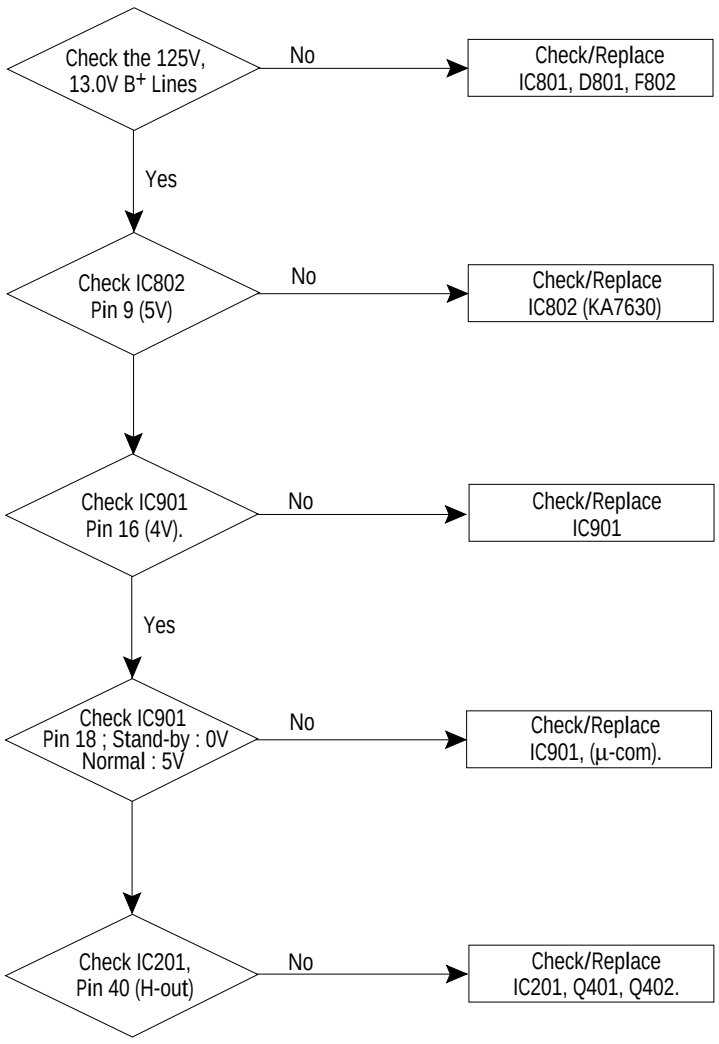
MEMO

5. Troubleshooting

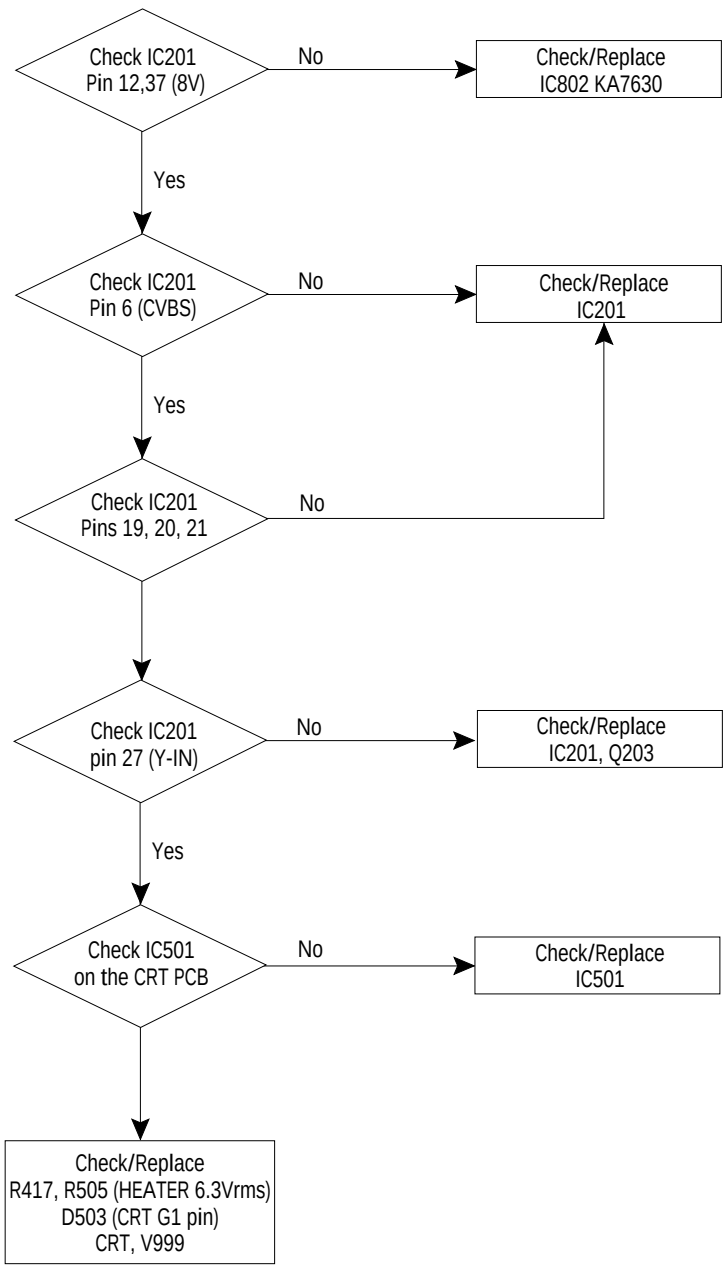
5-1 No Video (Raster On, No Sound)



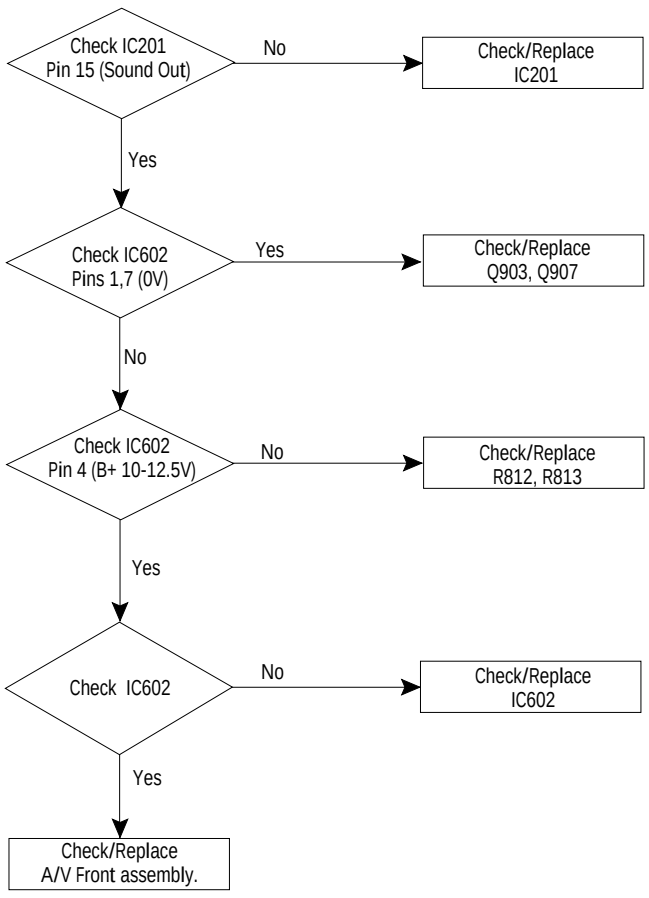
5-2 No Power


Check the 125V, 13.0V B+ Lines
No
Check/Replace IC801, D801, F802
Yes
Check IC802 Pin 9 (5V)
No
Check/Replace IC802 (KA7630)
Check IC901 Pin 16 (4V).
No
Check/Replace IC901
Yes
Check IC901 Pin 18 ; Stand-by : 0V Normal : 5V
No
Check/Replace IC901, (μ-com).
Check IC201, Pin 40 (H-out)
No
Check/Replace IC201, Q401, Q402.

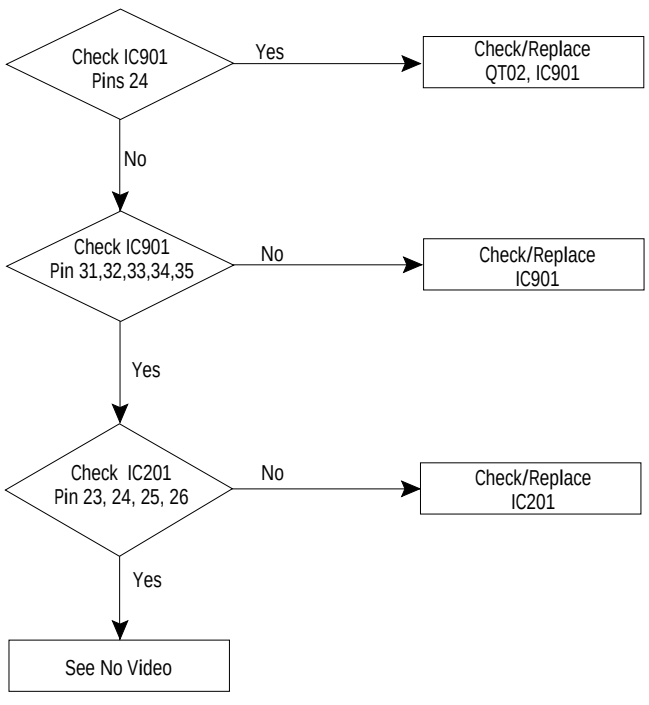
5-3 No Video (Sound OK)



5-4 No Sound (Video OK)

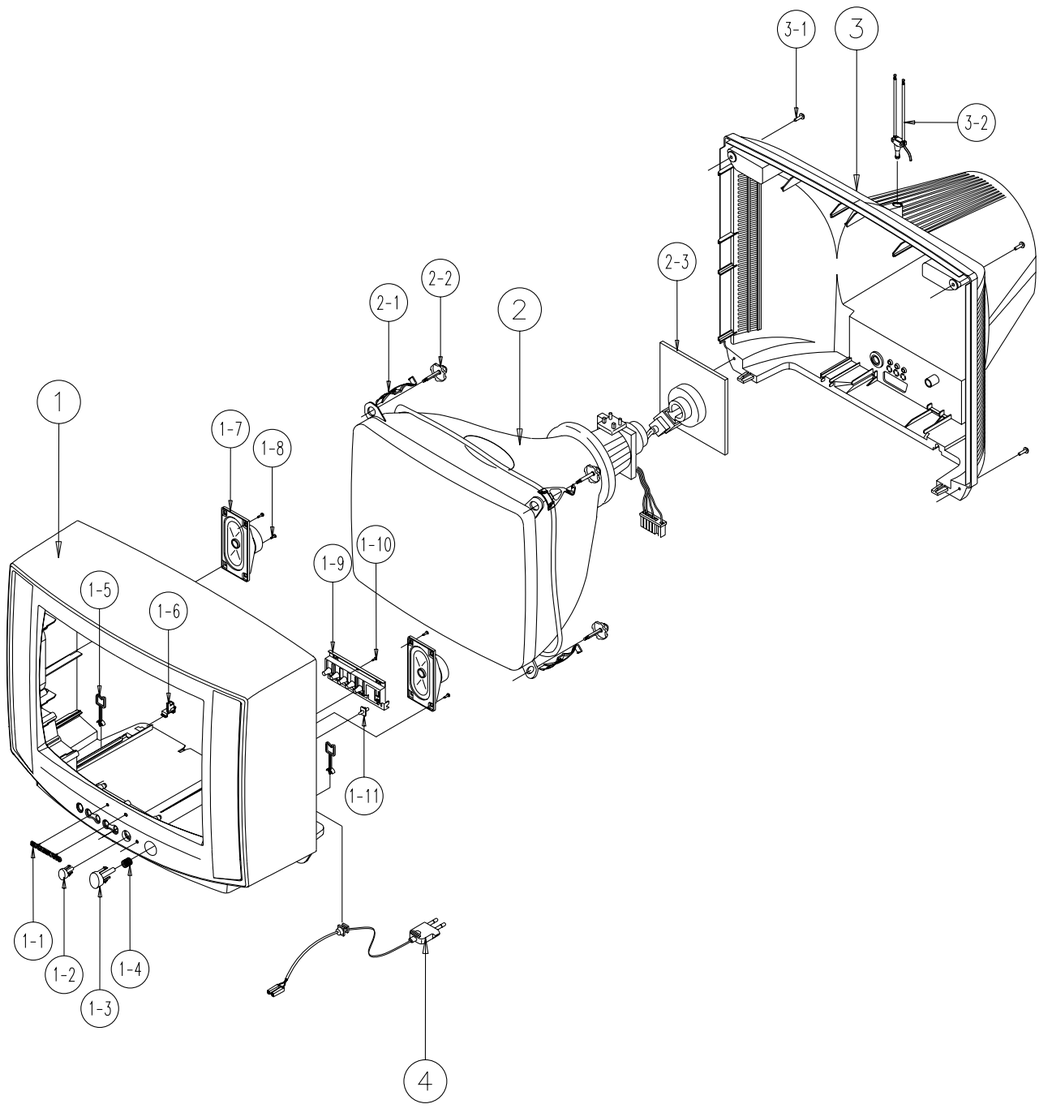


5-5 No TTX



6. Exploded View & Parts List

6-1 CK50H1VR5X/BWT



No	Code No	Description	Specification	Q'ty	Remark
1	AA91-10370D	ASSY-CABINET,FRONT	-,CK50H1VR,BK708P HITRON,HB,BL	1	
	AA64-31230D	CABINET-FRONT	-,CK50H1VR,BK708P HITRON,HIPS,	1	
1-1	AA64-70010B	BADGE-BRAND	AL,SS R2000 25,SILVER,L50,-,-,	1	
1-2	AA64-40495A	WINDOW-REMOCON	-,331,501H,-,PC,-,VIOLET,-	1	
1-3	AA64-10768D	KNOB-POWER	-,33.501H,NO-SILK,ABS,HB,BLK	1	
1-4	AA61-60003T	SPRING-CS	-,SUS304,0.5,OD7,H13.5,N5,-,-,	1	
1-5	AA65-30105A	CLAMP-WIRE	NYLON 66,V2,NTR,15MM,ALL MODEL	1	
1-6	AA61-40113A	STOPPER-PCB	501H,HIPS,NTR,HB,-,-	1	
1-7	3001-000191	SPEAKER	3W,8ohm,90dB,180Hz	2	
1-8	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	4	
1-9	AA64-10767A	KNOB-CONTROL	-,-,-,ABS,HB,BLK	1	
1-10	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	1	
1-11	AA64-40496A	INDICATOR-LED	-,-,-,ACRYL,-,-,-	1	
2	AA03-10029W	CRT-COLOR	-,A48KRD82X(H),+380mG,20,90de	1	
2-1	AA65-30107A	CLAMP-D,COIL	NYLON 66,V2,NTR,-,20~22 INCH,-	4	
2-2	AA60-10050R	SCREW-ASSY	WC,HH,+,M5,L31.5,SWRCH18A,ZPC(	4	
2-3	3704-001090	SOCKET-CRT	9P,15.24PI,26.5PI,SN,-	1	
3	AA64-31231B	CABINET-BACK	-,501H,-,HIPS,V2,BLK,-,-	1	
3-1	6002-000514	SCREW-TAPPING	RH,+,2,M4,L15,ZPC(BLK),SWRCH18	4	
3-2	AA42-10001V	ANT-ROD	-,3S,620mm,BRN,UL/CSA	1	
4	AA39-10001G	POWER-CORD	-,KKP-419C,KLCE-2F,2.286m,HOUS	1	